2006-08 BRAKES

ABS System - Civic (All Except Hybrid)

COMPONENT LOCATION INDEX

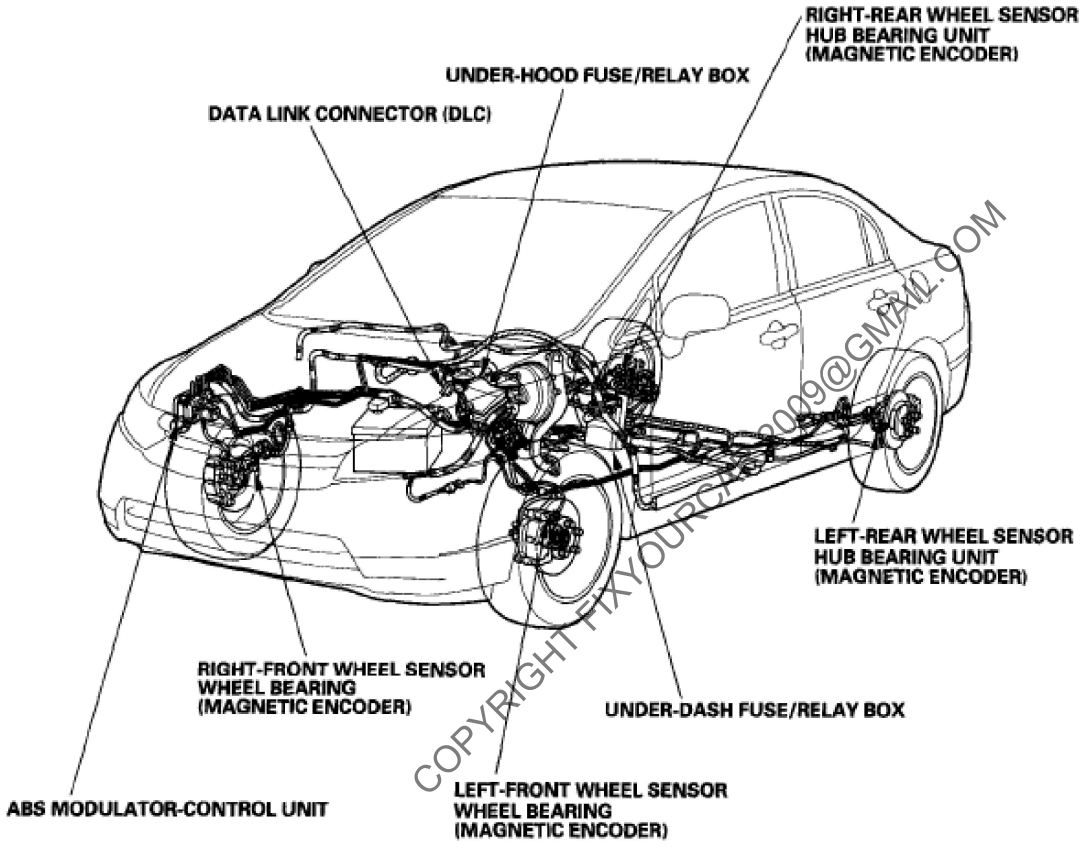
RIGHT-REAR WHEEL SENSOR HUB BEARING UNIT (MAGNETIC ENCODER)
UNDER-HOOD FUSE/RELAY BOX
DATA LINK CONNECTOR (DLC)
LEFT-REAR WHEEL SENSOR HUB BEARING UNIT (MAGNETIC ENCODER)
RIGHT-FRONT WHEEL SENSOR WHEEL BEARING (MAGNETIC ENCODER)
UNDER-DASH FUSE/RELAY BOX
ABS MODULATOR-CONTROL UNIT
LEFT-FRONT WHEEL SENSOR WHEEL BEARING (MAGNETIC ENCODER)

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Fig. 1: Locating ABS Components

GENERAL TROUBLESHOOTING INFORMATION

SYSTEM INDICATOR

This system has two indicators:

- ABS indicator (A)
- Brake system indicator (B)

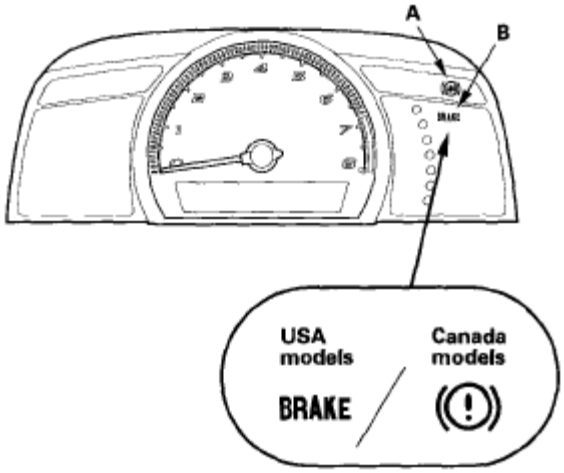

Fig. 2: Identifying ABS And Brake System Indicators

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When the system is OK, each indicator comes on for about 2 seconds after turning the ignition switch ON (II), then goes off.

When the system detects a problem, a DTC will be set and, depending upon the failure, the ABS modulator-control unit will determine which indicator(s) will be turned on. If the problem goes away (system returns to normal), the indicator(s) will be controlled in the following way depending upon the DTC that was set:

- The indicator(s) will come on and stay on when the ignition switch is ON (II).
- The indicator(s) will automatically go off.
- The indicator(s) will go off after the vehicle is driven.

ABS Indicator

The ABS indicator comes on when the ABS function is lost. The brakes still work like a conventional system.

Brake System Indicator

The brake system indicator comes on when the EBD function is lost, the parking brake is applied, and/or the brake fluid level is low.

NOTE: If two or more wheel sensors fail, the brake system indicator will come on.

DIAGNOSTIC TROUBLE CODE (DTC)

- The memory can hold all DTCs. However, when the same DTC is detected more than once, the more recent DTC is written over the earlier one. Therefore, when the same problem is detected repeatedly, it is memorized as a single DTC.
- The DTCs are indicated in the order they occur.
- The DTCs are memorized in the EEPROM. Therefore, the memorized DTCs cannot be canceled by disconnecting the battery. Do the specified procedures to clear the DTCs.

SELF-DIAGNOSIS

- Self-diagnosis can be classified into two categories:
  - Initial diagnosis: Done right after the ignition switch is turned ON (II) and until the ABS indicator goes off.
  - Regular diagnosis: Done right after the initial diagnosis until the ignition switch is turned OFF.
- When the system detects a problem, the ABS modulator-control unit shifts to fail-safe mode.

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KICKBACK

The pump motor operates when the ABS modulator-control unit is functioning, and the fluid in the reservoir is forced out to the master cylinder, causing kickback at the brake pedal.

PUMP MOTOR

- The pump motor operates when the ABS modulator-control unit is functioning.
- The ABS modulator-control unit checks the pump motor operation during regular diagnosis when the vehicle is driven over 10 mph (15 km/h) the first time after the ignition switch is turned ON (II). You may hear the motor operate at this time, but it is normal.

BRAKE FLUID REPLACEMENT/AIR BLEEDING

Brake fluid replacement and air bleeding procedures are identical to the procedures used on vehicles without ABS (see **BRAKE SYSTEM BLEEDING**).

HOW TO TROUBLESHOOT DTCS

The troubleshooting procedures assume that the cause of the problem is still present and the ABS indicator is still on. Following a troubleshooting procedure for a code that has been cleared and does not reset can result in incorrect diagnosis.

1. Question the customer about the conditions when the problem occurred, and try to reproduce the same conditions for troubleshooting. Find out when the ABS indicator came on, such as during ABS operation, after ABS operation, when vehicle was traveling at a certain speed, etc.
2. When the ABS indicator does not come on during the test-drive, but troubleshooting is done based on the DTC, check for loose connectors, poor contact of the terminals, etc. before you start troubleshooting.
3. After troubleshooting, or repairs are done, clear the DTCs, and test-drive the vehicle under the same conditions that originally set the DTCs. Make sure the ABS indicator does not come on.
4. Check for other unit DTCs which are connected via F-CAN, if there are DTCs that are related to F-CAN, the most likely cause was that the ignition switch was turned ON (II) with the ABS modulator-control unit connector disconnected. Clear the DTCs. Check for PGM-FI and ABS codes, and troubleshoot those first.

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INTERMITTENT FAILURES

The term "intermittent failure" means a system may have had a failure, but it checks OK now. If the indicator(s) of the system does not come on, check for poor connections or loose pins at all connectors related to the circuit that you are troubleshooting. If the indicators were on but then went out, the original problem may have been intermittent.

HOW TO USE THE HDS (HONDA DIAGNOSTIC SYSTEM)

1. If the system indicators stay on, connect the HDS to the data link connector (DLC) (A) located under the driver's side of the dashboard.

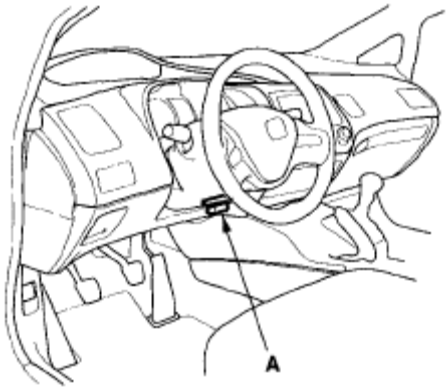

Fig. 3: Connecting HDS To DLC

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2. Turn the ignition switch ON (II).
3. Make sure the HDS communicates with the vehicle and the ABS modulator-control unit. If it doesn't, troubleshoot the DLC circuit: Except Si model (see **DLC CIRCUIT TROUBLESHOOTING**), Si model (see **DLC CIRCUIT TROUBLESHOOTING**).
4. Check the diagnostic trouble code (DTC) and note it. Also check the on board snapshot data, and download any data found. Then refer to the indicated DTC's troubleshooting, and begin the appropriate troubleshooting procedure.

NOTE:

- **The HDS communication will be stopped when the vehicle speed is at 31 mph (50 km/h) or more.**
- **The HDS can read the DTC, current data, and other system data.**
- **For specific operations, refer to the Help menu that came with the HDS.**

HOW TO RETRIEVE DTCS

1. With the ignition switch to LOCK (0), connect the HDS to the data link connector (DLC) under the driver's side of the dashboard.
2. Turn the ignition switch ON (II).
3. Make sure the HDS communicates with the vehicle and the ABS modulator-control unit. If it doesn't, troubleshoot the DLC circuit: Except Si model (see **DLC CIRCUIT TROUBLESHOOTING**), Si model (see **DLC CIRCUIT**

TROUBLESHOOTING).

4. Follow the prompts on the HDS to display the DTC(s) on the screen. After determining the DTC, refer to the **DTC TROUBLESHOOTING**.
5. Turn the ignition switch to LOCK (0).

HOW TO CLEAR DTCS

1. With the ignition switch to LOCK (0), connect the HDS to the data link connector (DLC) under the driver's side of the dashboard.
2. Turn the ignition switch ON (II).
3. Make sure the HDS communicates with the vehicle and the ABS modulator-control unit. If it doesn't, troubleshoot the DLC circuit: Except Si model (see **DLC CIRCUIT TROUBLESHOOTING**); Si model (see **DLC CIRCUIT TROUBLESHOOTING**).
4. Clear the DTC(s) by following the screen prompts on the HDS.
5. Turn the ignition switch to LOCK (0).

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DTC TROUBLESHOOTING INDEX

DTC TROUBLESHOOTING INDEX

DTC		Detection Item	ABS Indicator	Brake System Indicator
11	-13	Right-front wheel sensor circuit malfunction	ON	ON/OFF(1)
12	-11	Right-front wheel sensor electrical noise or intermittent interruption	ON	ON/OFF(1)
	-12	Right-front wheel sensor short to the other sensor circuit	ON	ON/OFF(1)
	-21	Right-front wheel	ON	

		sensor installation error		ON/OFF(1)
	-22	Right-front wheel sensor installation error (19 mph (30 km/h) or more)	ON	ON/OFF(1)
	-23	Right-front wheel sensor installation error (0 to 9 mph (0 to 15 km/h))	ON	ON/OFF(1)
13	-13	Left-front wheel sensor circuit malfunction	ON	ON/OFF(1)
14	-11	Left-front wheel sensor electrical noise or intermittent interruption	ON	ON/OFF(1)
	-12	Left-front wheel sensor short to the other sensor circuit	ON	ON/OFF(1)
	-21	Left-front wheel sensor installation error	ON	ON/OFF(1)
	-22	Left-front wheel sensor installation error (19 mph (30 km/h) or more)	ON	ON/OFF(1)
	-23	Left-front wheel sensor	ON	ON/OFF(1)

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		installation error (0 to 9 mph (0 to 15 km/h))		
15	-13	Right-rear wheel sensor circuit malfunction	ON	ON/OFF(1)
16	-11	Right-rear wheel sensor electrical noise or intermittent interruption	ON	ON/OFF(1)
	-12	Right-rear wheel sensor short to the other sensor circuit	ON	ON/OFF(1)
	-21	Right-rear wheel sensor installation error	ON	ON/OFF(1)
	-22	Right-rear wheel sensor installation error (19 mph (30 km/h) or more)	ON	ON/OFF(1)
	-23	Right-rear wheel sensor installation error (0 to 9 mph (0 to 15 km/h))	ON	ON/OFF(1)
17	-13	Left-rear wheel sensor circuit malfunction	ON	ON/OFF(1)
18	-11	Left-rear wheel sensor electrical noise or	ON	ON/OFF(1)

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		intermittent interruption		
	-12	Left-rear wheel sensor short to the other sensor circuit	ON	ON/OFF(1)
	-21	Left-rear wheel sensor installation error	ON	ON/OFF(1)
	-22	Left-rear wheel sensor installation error (19 mph (30 km/h) or more)	ON	ON/OFF(1)
	-23	Left-rear wheel sensor installation error (0 to 9 mph (0 to 15 km/h))	ON	ON/OFF(1)
21	-11	Right-front magnetic encoder malfunction (pulse missing)	ON	ON/OFF(1)
22	-11	Left-front magnetic encoder malfunction (pulse missing)	ON	ON/OFF(1)
23	-11	Right-rear magnetic encoder malfunction (pulse missing)	ON	ON/OFF(1)
24	-11	Left-rear magnetic encoder malfunction	ON	ON/OFF(1)

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		(pulse missing)		
31	-01	ABS right-front inlet solenoid valve malfunction (solenoid initial pulse)	ON	ON
	-21	ABS right-front inlet solenoid valve malfunction (solenoid pulse)	ON	ON
	-22	ABS right-front inlet solenoid valve malfunction (solenoid speculative)	ON	ON
	-23	ABS right-front inlet solenoid valve malfunction (solenoid stuck ON)	ON	ON
32	-01	ABS right-front outlet solenoid valve malfunction (solenoid initial pulse)	ON	ON
	-21	ABS right-front outlet solenoid valve malfunction (solenoid pulse)	ON	ON

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	-22	ABS right-front outlet solenoid valve malfunction (solenoid speculative)	ON	ON
	-23	ABS right-front outlet solenoid valve malfunction (solenoid stuck ON)	ON	ON
33	-01	ABS left-front inlet solenoid valve malfunction (solenoid initial pulse)	ON	ON
	-21	ABS left-front inlet solenoid valve malfunction (solenoid pulse)	ON	ON
	-22	ABS left-front inlet solenoid valve malfunction (solenoid speculative)	ON	ON
	-23	ABS left-front inlet solenoid valve malfunction (solenoid stuck ON)	ON	ON

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34	-01	ABS left-front outlet solenoid valve malfunction (solenoid initial pulse)	ON	ON
	-21	ABS left-front outlet solenoid valve malfunction (solenoid pulse)	ON	ON
	-22	ABS left-front outlet solenoid valve malfunction (solenoid speculative)	ON	ON
	-23	ABS left-front outlet solenoid valve malfunction (solenoid stuck ON)	ON	ON
35	-01	ABS right-rear inlet solenoid valve malfunction (solenoid initial pulse)	ON	ON
	-21	ABS right-rear inlet solenoid valve malfunction (solenoid pulse)	ON	ON
	-22	ABS right-rear	ON	ON

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		inlet solenoid valve malfunction (solenoid speculative)		
	-23	ABS right-rear inlet solenoid valve malfunction (solenoid stuck ON)	ON	ON
36	-01	ABS right-rear outlet solenoid valve malfunction (solenoid initial pulse)	ON	ON
	-21	ABS right-rear outlet solenoid valve malfunction (solenoid pulse)	ON	ON
	-22	ABS right-rear outlet solenoid valve malfunction (solenoid speculative)	ON	ON
	-23	ABS right-rear outlet solenoid valve malfunction (solenoid stuck ON)	ON	ON
37	-01	ABS left-rear	ON	ON

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		inlet solenoid valve malfunction (solenoid initial pulse)		
	-21	ABS left-rear inlet solenoid valve malfunction (solenoid pulse)	ON	ON
	-22	ABS left-rear inlet solenoid valve malfunction (solenoid speculative)	ON	ON
	-23	ABS left-rear inlet solenoid valve malfunction (solenoid stuck ON)	ON	ON
38	-01	ABS left-rear outlet solenoid valve malfunction (solenoid initial pulse)	ON	ON
	-21	ABS left-rear outlet solenoid valve malfunction (solenoid pulse)	ON	ON
	-22	ABS left-rear outlet solenoid	ON	ON

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		valve malfunction (solenoid speculative)		
	-23	ABS left-rear outlet solenoid valve malfunction (solenoid stuck ON)	ON	ON
41	-21	Right-front wheel lock	ON	ON/OFF(1)
42	-21	Left-front wheel lock	ON	ON/OFF(1)
43	-21	Right-rear wheel lock	ON	ON/OFF(1)
44	-21	Left-rear wheel lock	ON	ON/OFF(1)
51	-11	Motor lock	ON	OFF
	-12	Motor lock circuit malfunction	ON	OFF
	-13	Motor relay OFF malfunction	ON	OFF
52	-12	Motor stuck OFF	ON	OFF
53	-01	Motor relay stuck ON 1	ON	OFF
	-12	Motor relay stuck ON 2	ON	OFF
54	-03	Fail-safe relay 1 stuck ON	ON	ON
	-04	Fail-safe relay 1 stuck OFF (initial)	ON	ON

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	-21	Fail-safe relay 1 stuck OFF (main)	ON	ON
61	-01	Modulator-control unit initial IG low voltage	ON	ON
	-21	Modulator-control unit power source low voltage 1	ON	ON
	-22	Modulator-control unit power source low voltage 2	ON	OFF
	-23	Modulator-control unit power source low voltage 3	ON	ON
62	-21	Modulator-control unit IG high voltage	ON	ON
71	-21	Right-front or left-rear different diameter tire malfunction	ON	ON
	-22	Left-front or right-rear different diameter tire malfunction	ON	ON
	-23	Right-front and right-rear different diameter tire malfunction	ON	ON
	-24	Left-front and	ON	ON

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		left-rear different diameter tire malfunction		
	-25	Right-front and left-front different diameter tire malfunction	ON	ON
	-26	Right-rear and left-rear different diameter tire malfunction	ON	ON
81	-01	Central processing unit (CPU) internal circuit malfunction	ON	ON
	-05	Central processing unit (CPU) internal circuit malfunction	ON	ON
	-06	Central processing unit (CPU) internal circuit malfunction	ON	ON
	-08	Central processing unit (CPU) internal circuit malfunction	ON	ON
	-11	Central processing unit (CPU) internal	ON	ON

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	circuit malfunction		
-14	Central processing unit (CPU) internal circuit malfunction	ON	ON
-23	Central processing unit (CPU) internal circuit malfunction	ON	ON
-30	Central processing unit (CPU) internal circuit malfunction	ON	ON
-31	Central processing unit (CPU) internal circuit malfunction	ON	ON
-32	Central processing unit (CPU) internal circuit malfunction	ON	ON
-51	Central processing unit (CPU) internal circuit malfunction	ON	ON
-52	Central processing unit	ON	ON

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		(CPU) internal circuit malfunction		
	-71	Central processing unit (CPU) internal circuit malfunction	ON	OFF
86	-01	F-CAN bus-off malfunction	OFF	OFF
	-24	F-CAN communication with engine malfunction	OFF	OFF
	-25	F-CAN communication with engine malfunction	OFF	OFF
	-FF	F-CAN communication with ABS malfunction	OFF	OFF
(1) Brake system indicator turns ON when 2 or more wheel sensors fail.				

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SYMPTOM TROUBLESHOOTING INDEX

When the vehicle has one of these symptoms, check for a diagnostic trouble code (DTC) with the HDS. If there is no DTC, do the diagnostic procedure for the symptom, in the sequence listed, until you find the cause.

SYMPTOM TROUBLESHOOTING INDEX

Symptom	Diagnostic procedure
HDS does not communicate with	Troubleshoot the DLC circuit: Except Si model (see

the ABS modulator-control unit or the vehicle	**DLC CIRCUIT TROUBLESHOOTING**), Si model (see **DLC CIRCUIT TROUBLESHOOTING**).
ABS indicator does not come on	1. Do the gauge control module troubleshooting (see **SELF-DIAGNOSTIC FUNCTION**). 2. Substitute a known-good ABS modulator-control unit, then recheck. If it is OK, replace the original ABS modulator-control unit: Except Si model (see **REMOVAL - EXCEPT SI MODEL**), Si model (see **REMOVAL - SI MODEL**).
ABS indicator does not go off, and no DTCs are stored	1. Symptom Troubleshooting (see **SYMPTOM TROUBLESHOOTING**). 2. Do the gauge control module troubleshooting (see **SELF-DIAGNOSTIC FUNCTION**).
Brake system indicator does not come on	1. Do the gauge control module troubleshooting (see **SELF-DIAGNOSTIC FUNCTION**). 2. Substitute a known-good ABS modulator-control unit, then recheck. If it is OK, replace the original ABS modulator-control unit; Except Si model (see **REMOVAL - EXCEPT SI MODEL**), Si model (see **REMOVAL - SI MODEL**).
Brake system indicator does not go off, and no DTCs are stored	1. Symptom Troubleshooting (see **SYMPTOM TROUBLESHOOTING**). 2. Do the gauge control module troubleshooting (see **SELF-DIAGNOSTIC FUNCTION**).
ABS indicator and brake system indicator do not go off at the same time	1. Symptom Troubleshooting (see **SYMPTOM TROUBLESHOOTING**). 2. Do the gauge control module troubleshooting (see **SELF-DIAGNOSTIC FUNCTION**).

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SYSTEM DESCRIPTION

ABS MODULATOR-CONTROL UNIT INPUTS AND OUTPUTS FOR 25P CONNECTOR

Wire side of female terminals

Fig. 4: Identifying ABS Modulator-Control Unit Inputs And Outputs For 25P Connector

ABS MODULATOR-CONTROL UNIT INPUTS AND OUTPUTS FOR 25P CONNECTOR

Terminal number	Wire color	Terminal sign	Description	Measurement (Disconnect the ABS modulator-control unit 25P connector)		
				Terminal	Conditions	Results
1	WHT	CAN-H	F-CAN communication circuit	-	-	-
2	GRN	FR+B	Detects right-front wheel sensor signal	-	-	-
3	GRY	FL-GND	Detects left-front wheel sensor signal	-	-	-
5	PUR	RL-GND	Detects left-rear wheel sensor signal	-	-	-
6	LT GRN	RR+B	Detects right-rear wheel sensor signal	-	-	-
8	WHT	FSR+B	Power source for the fail-safe relay	8-GND	At all times	Battery voltage
9	RED	MR+B	Power source for the motor	9-GND	At all times	Battery

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			relay			voltage
10	LT BLU	K-LINE	Communication with HDS	-	-	-
12	ORN	FL+B	Detects left-front wheel sensor signal	-	-	-
14	BLU	RL+B	Detects left-rear wheel sensor signal	-	-	-
15	WHT	RR-GND	Detects right-rear wheel sensor signal	-	-	-
16	GRY	IG1	Power source for activating the system	16-GND	Ignition switch	ON (II) Battery voltage
17	RED	CAN-L	F-CAN communication circuit	-	-	-
18	PNK	FR-GND	Detects right-front wheel sensor signal	-	-	-
24	BLK	GND	Ground for the ABS modulator-control unit	24-GND	At all times	Continuity
25	BLK	MR-GND	Ground for the pump motor	25-GND	At all times	Continuity

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SYSTEM OUTLINE

This system is composed of the ABS modulator-control unit, the wheel sensors, and the system indicators in the gauge control module. The ABS modulator-control unit controls the anti-lock brake and the brakes distribution functions.

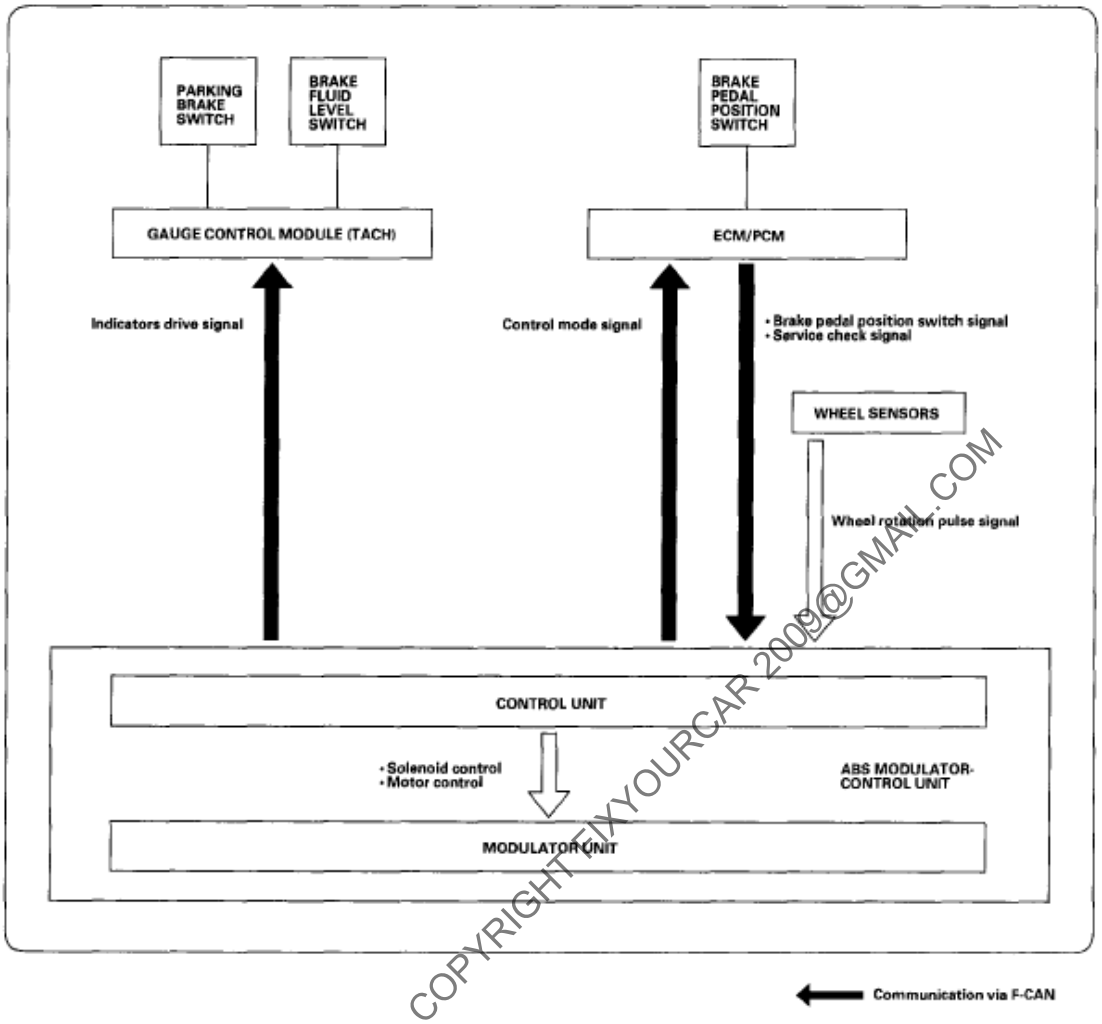

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Fig. 5: Identifying ABS Modulator-Control Unit System Outline

ABS FEATURES

Without ABS, when the brake pedal is pressed while driving, the wheels sometimes lock before the vehicle comes to a stop. In such an event, the maneuverability of the vehicle is reduced if the front wheels are locked, and the stability of the vehicle is reduced if the rear wheels are locked, creating an extremely unstable condition. With ABS, the system precisely controls the slip rate of the wheels to ensure maximum grip force from the tires, and it thereby ensures maneuverability and stability of the vehicle. The ABS calculates the slip rate of the wheels based on the four wheel speeds, then it controls the brake fluid pressure to reach the target slip rate.

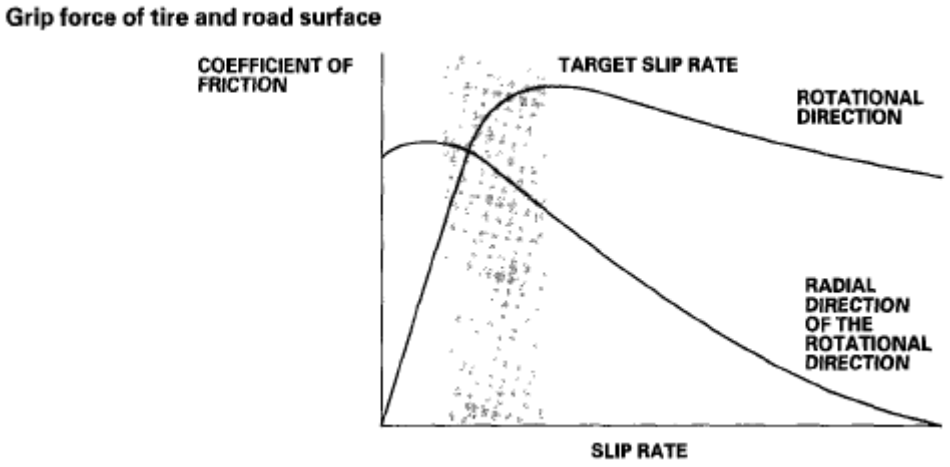

Fig. 6: Identifying Grip Force Of Tire And Road Surface

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The control unit detects the wheel speed based on the wheel sensor signals it received, then it calculates the vehicle speed based on the detected wheel speed. The control unit detects the vehicle speed during deceleration based on the rate of deceleration.

The control unit calculates the slip rate of each wheel, and transmits the control signal to the modulator unit solenoid valve when the slip rate is high.

The hydraulic control has three modes: Pressure intensifying, pressure reducing, and pressure retaining.

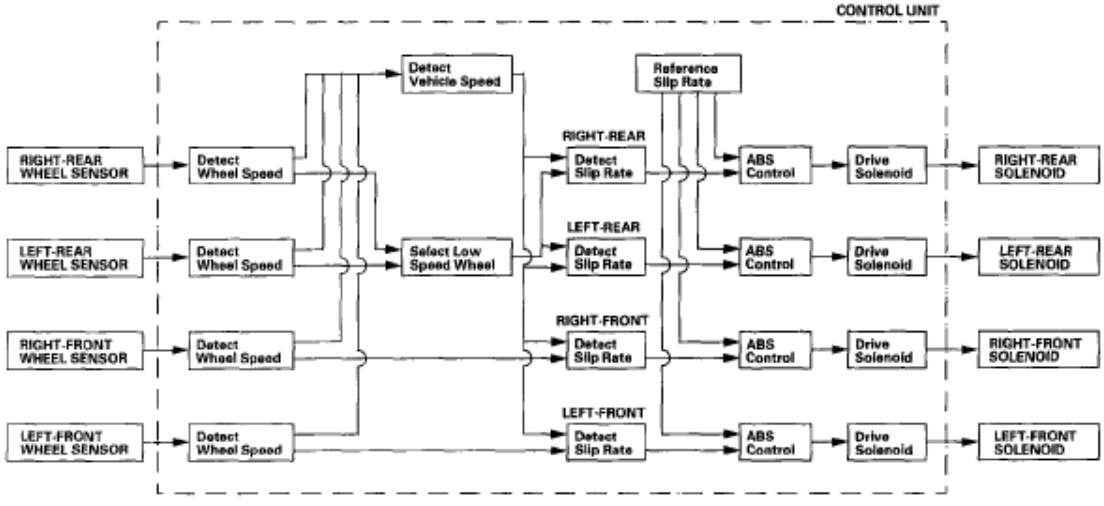

Fig. 7: Identifying Hydraulic Control Unit Flow Diagram

EBD FEATURES

The electronic brake distribution (EBD) feature helps control vehicle braking by adjusting the rear brake force in accordance with the rear wheel load before the ABS operates. Based on the wheel sensor signals, the control unit uses the modulator to control the rear brakes individually. When the rear wheel speed is less than the front wheel speed, the ABS modulator-control unit retains the current rear brake fluid pressure by closing the inlet valve in the modulator. As the rear wheel speed increases and approaches the front wheel speed, the ABS modulator-control unit increases the rear brake fluid pressure by momentarily opening the inlet valve. This whole process is repeated very rapidly. While this is happening, there is kickback at the brake pedal.

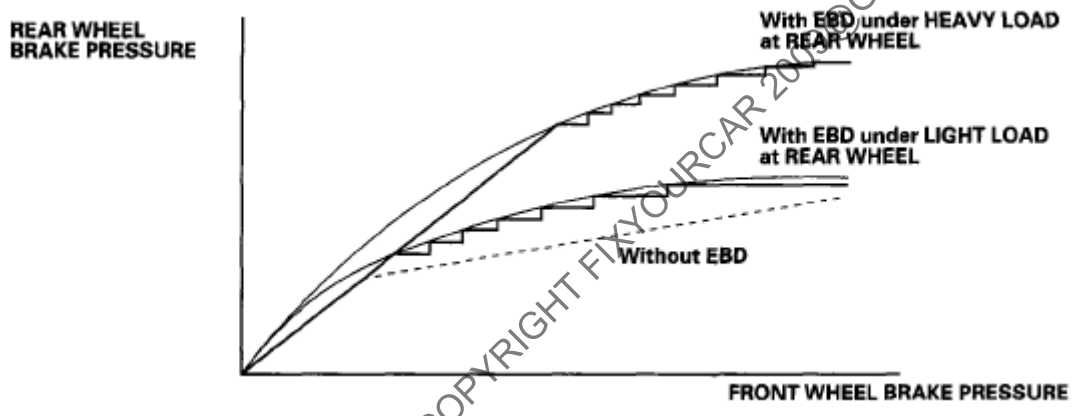

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Fig. 8: Identifying Rear Wheel Brake Pressure

MODULATOR UNIT

The ABS modulator consists of the inlet solenoid valve, the outlet solenoid valve, the reservoir, the pump, the pump motor, and the damping chamber. The modulator reduces the caliper fluid pressure directly. It is a circulating-type modulator because the brake fluid circulates through the caliper, the reservoir, and the master cylinder. The hydraulic control has three modes; pressure intensifying, pressure retaining, and pressure reducing. The hydraulic circuit is an independent four channel type; one channel for each wheel.

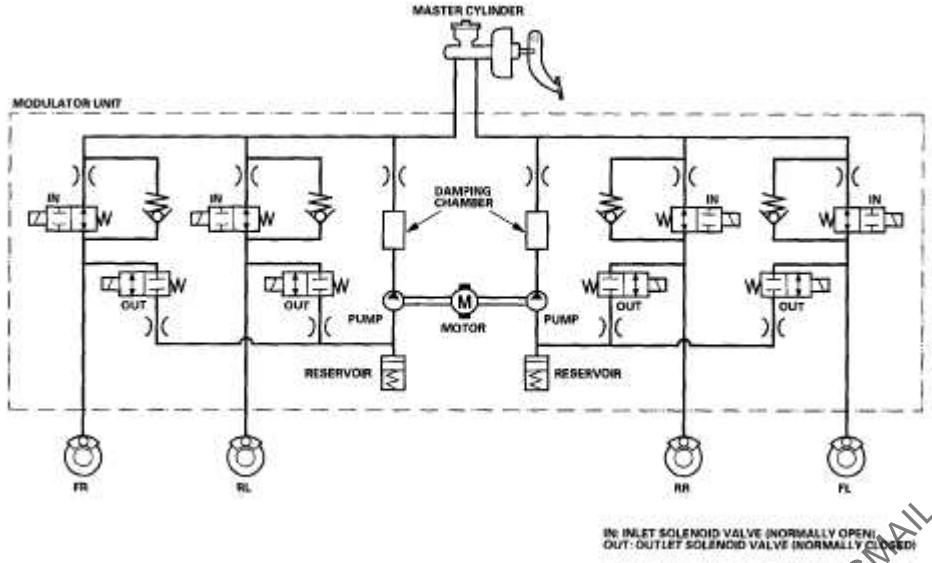

Fig. 9: Identifying Modulator Unit Circuit Diagram

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MODES AND INLET/OUTLET SOLENOID VALVE POSITION

Mode	Inlet Solenoid Valve	Outlet Solenoid Valve	Brake Fluid
Pressure intensifying mode	open	closed	Master cylinder fluid is pumped out to the caliper.
Pressure retaining mode	closed	closed	Caliper fluid is retained by the inlet and outlet valves.
Pressure reducing mode	closed	open	• Caliper fluid flows through the outlet valve to the reservoir. • The motor pumps the reservoir fluid through the damping chamber to the master cylinder (1) .
(1) The motor will keep running until the operation of the one anti-lock brake control is finished with the first pressure reducing mode.			

CIRCUIT DIAGRAM

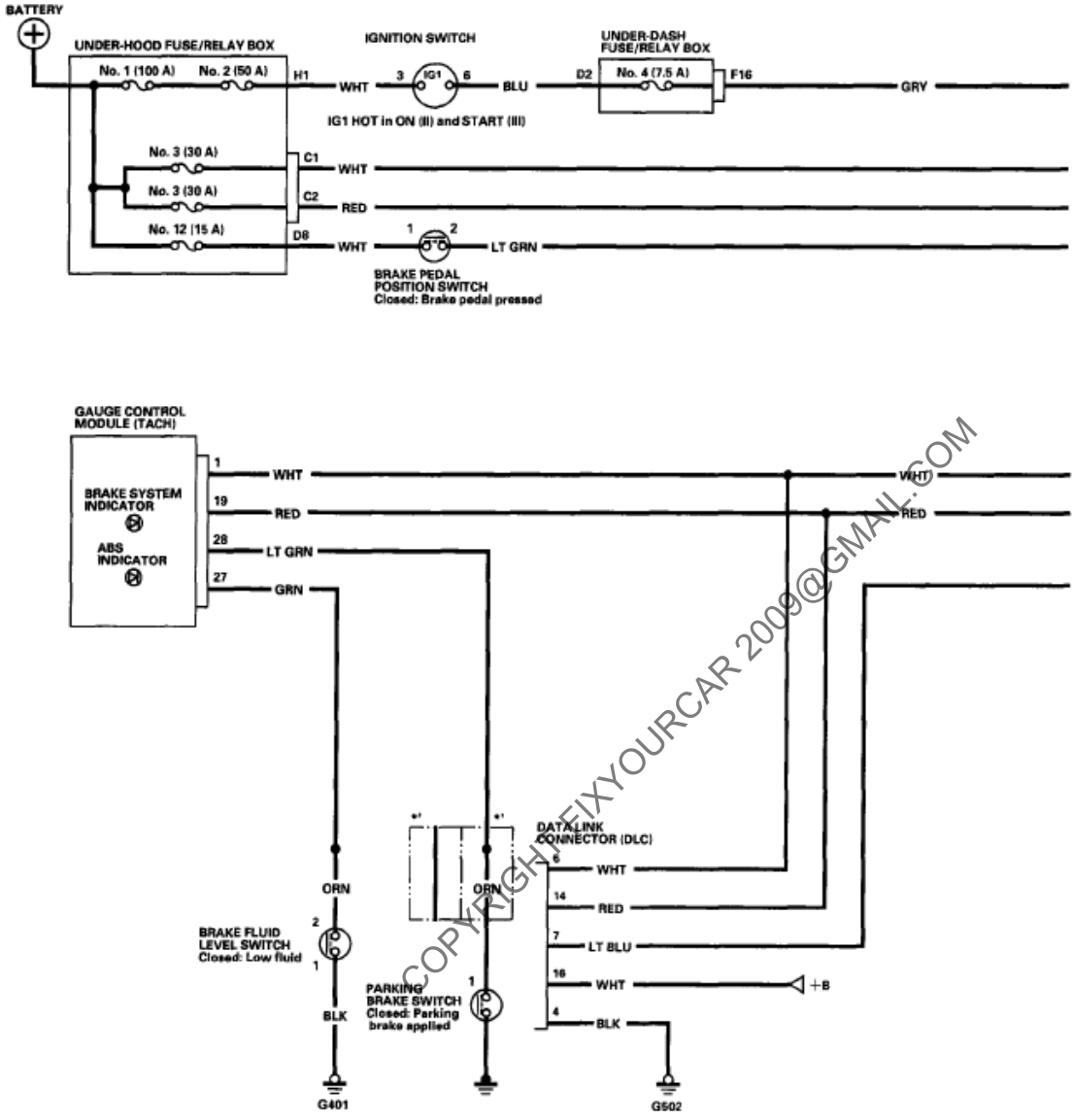

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Fig. 10: Anti-Lock Brake System Circuit Diagram (1 Of 3)

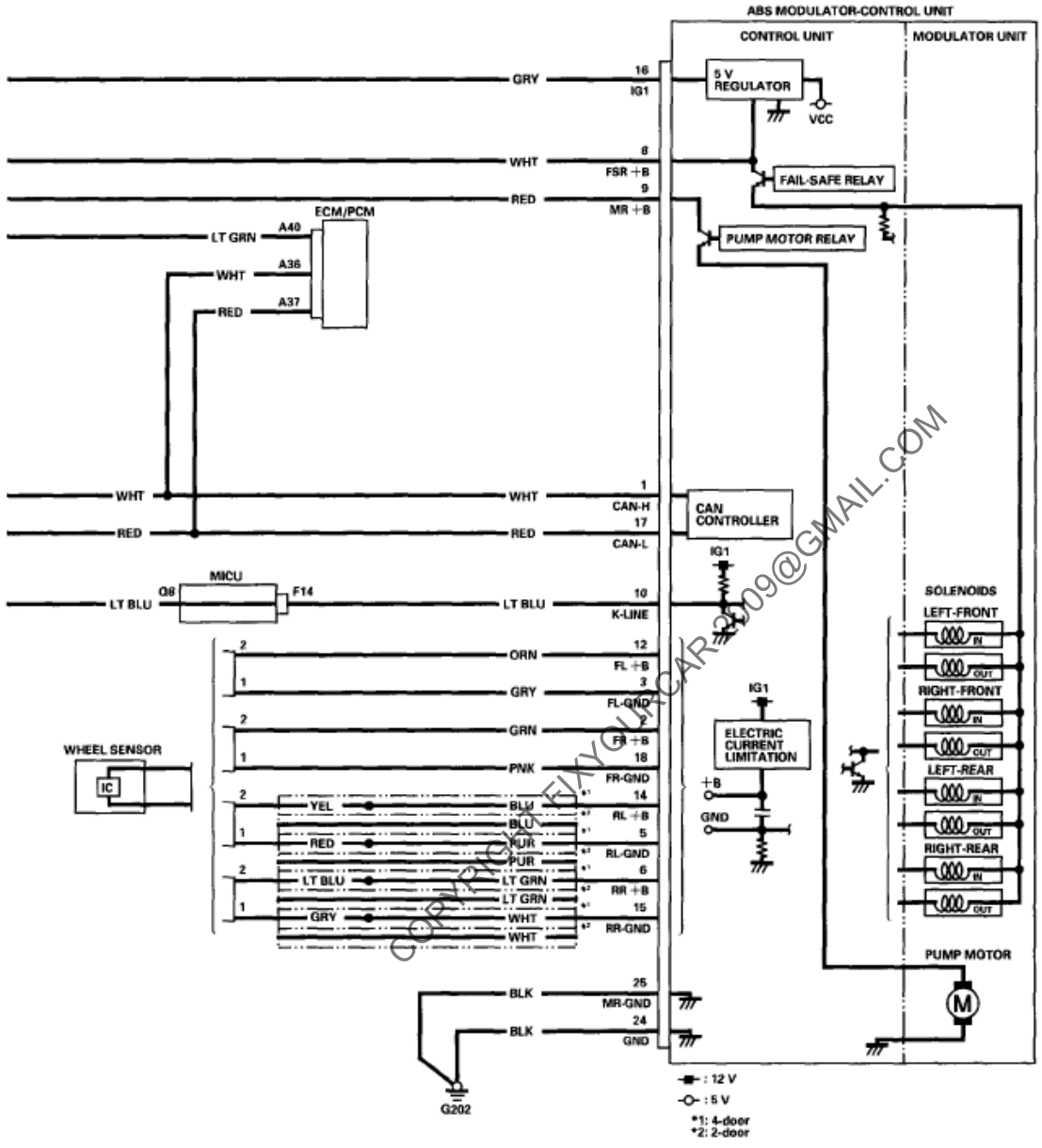

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Fig. 11: Anti-Lock Brake System Circuit Diagram (2 Of 3)

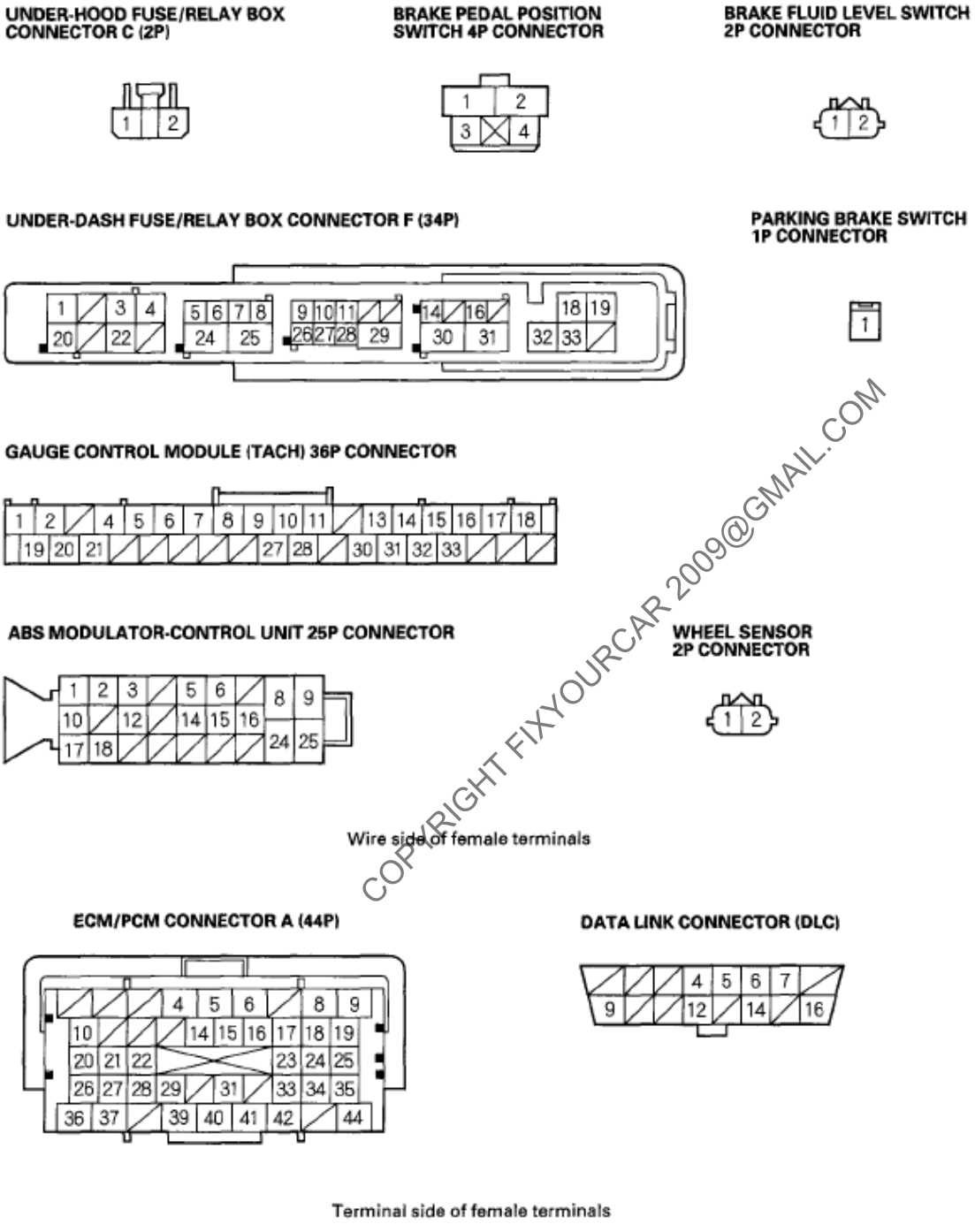
UNDER-HOOD FUSE/RELAY BOX CONNECTOR C (2P)
BRAKE PEDAL POSITION SWITCH 4P CONNECTOR
BRAKE FLUID LEVEL SWITCH 2P CONNECTOR
UNDER-DASH FUSE/RELAY BOX CONNECTOR F (34P)
PARKING BRAKE SWITCH 1P CONNECTOR
GAUGE CONTROL MODULE (TACH) 36P CONNECTOR
ABS MODULATOR-CONTROL UNIT 25P CONNECTOR
WHEEL SENSOR 2P CONNECTOR
Wire side of female terminals
ECM/PCM CONNECTOR A (44P)
DATA LINK CONNECTOR (DLC)
Terminal side of female terminals

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Fig. 12: Anti-Lock Brake System Circuit Diagram (3 Of 3)

DTC TROUBLESHOOTING

DTC 11-13: RIGHT-FRONT WHEEL SENSOR CIRCUIT MALFUNCTION; DTC 13-13: LEFT-FRONT WHEEL SENSOR CIRCUIT MALFUNCTION; DTC 15-13: RIGHT-REAR WHEEL SENSOR CIRCUIT MALFUNCTION; DTC 17-13: LEFT-REAR WHEEL SENSOR CIRCUIT MALFUNCTION

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Turn the ignition switch to LOCK (0), then turn it ON (II) again.
4. Check for DTCs with the HDS.

   Is DTC 11-13, 13-13, 15-13, and/or 17-13 indicated?

   YES - Go to step 5.

   NO - Intermittent failure, the system is OK at this time. Check for loose terminals between the wheel sensor 2P connector and the ABS modulator-control unit 25P connector. Refer to **INTERMITTENT FAILURES TROUBLESHOOTING** .

5. Turn the ignition switch to LOCK (0).
6. Disconnect the ABS modulator-control unit 25P connector.
7. Check for continuity between the appropriate ABS modulator-control unit 25P connector wheel sensor +B and GND terminals (see **ABS MODULATOR-CONTROL UNIT 25P CONNECTOR WHEEL SENSOR +B AND GND**), then check for continuity between the same terminals and reverse the positive and negative tester probes.

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ABS MODULATOR-CONTROL UNIT 25P CONNECTOR WHEEL SENSOR +B AND GND

DTC	ABS Modulator-control Unit 25P Connector Terminal No.	
11-13	No. 2	No. 18
13-13	No. 12	No. 3
15-13	No. 6	No. 15
17-13	No. 14	No. 5

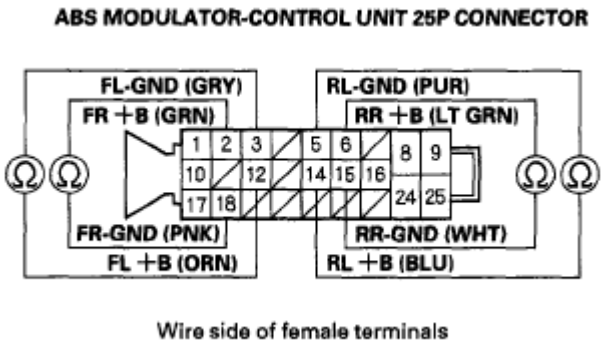

Fig. 13: Checking Continuity Between Appropriate ABS Modulator-Control Unit 25P Connector Wheel Sensor +B And GND Terminals

Is there continuity in both directions?

YES - Go to step 8.

NO - If there is no continuity in either direction, go to step 10. If there is continuity in only one direction, go to step 12.

8. Disconnect the appropriate wheel sensor 2P connector.
9. On the sensor side, check for continuity between appropriate wheel sensor 2P connector terminals No. 1 and No. 2, then check for continuity between the same terminals and reverse the positive and negative tester probes.

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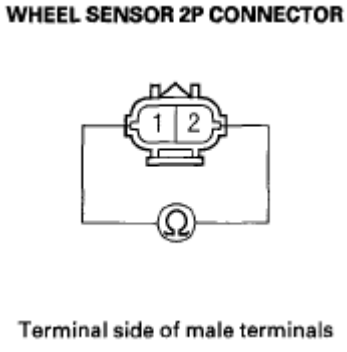

Fig. 14: Checking Continuity Between Appropriate Wheel Sensor 2P Connector Terminals No. 1 And No. 2

Is there continuity in both directions?

YES - Replace the appropriate wheel sensor (see **WHEEL SENSOR**

REPLACEMENT).

NO - Repair short in the wire between the appropriate wheel sensor and the ABS modulator-control unit.

10. Disconnect the appropriate wheel sensor 2P connector.
11. On the sensor side, check for continuity between appropriate wheel sensor 2P connector terminals No. 1 and No. 2, then check for continuity between the same terminals and reverse the positive and negative tester probes.

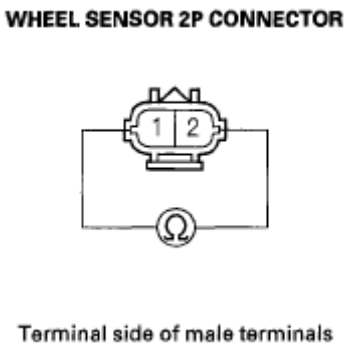

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Fig. 15: Checking Continuity Between Appropriate Wheel Sensor 2P Connector Terminals No. 1 And No. 2

Is there continuity in only one direction?

YES - Repair open in the wire between the appropriate wheel sensor and the ABS modulator-control unit.

NO - Replace the appropriate wheel sensor (see **WHEEL SENSOR REPLACEMENT**).

12. Check for continuity between body ground and the appropriate ABS modulator-control unit 25P connector terminal (see table).

BODY GROUND AND APPROPRIATE ABS MODULATOR-CONTROL UNIT 25P CONNECTOR TERMINAL

DTC	ABS Modulator-control Unit 25P Connector Terminal No.	
11-13	No. 2	No. 18
13-13	No. 12	No. 3

15-13	No. 6	No. 15
17-13	No. 14	No. 5

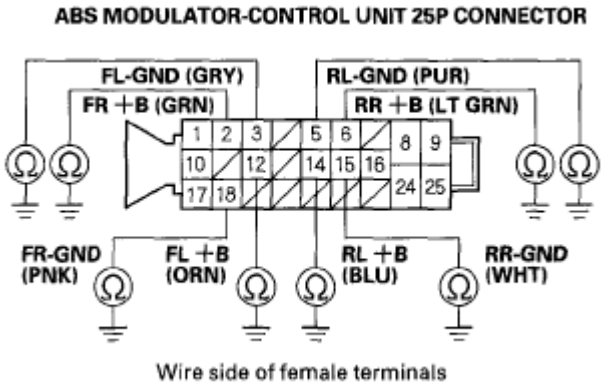

Fig. 16: Checking Continuity Between Body Ground And Appropriate ABS Modulator-Control Unit 25P Connector Terminal

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Is there continuity?

YES - Go to step 13.

NO - Go to step 15.

13. Disconnect the appropriate wheel sensor 2P connector.
14. On the sensor side, check for continuity between body ground and appropriate wheel sensor 2P connector terminal No. 1 and No. 2 individually.

NOTE: Check the wheel sensor while mounted on the vehicle.

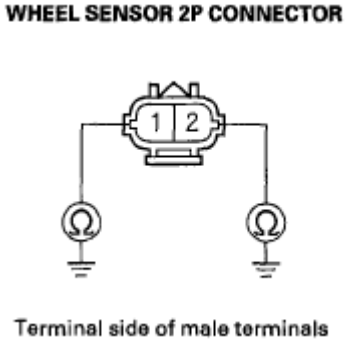

Fig. 17: Checking Continuity Between Body Ground And Appropriate

Wheel Sensor 2P Connector Terminal No. 1 And No. 2

Is there continuity?

YES - Replace the appropriate wheel sensor (see **WHEEL SENSOR REPLACEMENT**).

NO - Repair short to body ground in the wire between the appropriate wheel sensor and the ABS modulator-control unit.

15. Turn the ignition switch ON (II).
16. Measure voltage between body ground and the appropriate ABS modulator-control unit 25P connector terminal (see **BODY GROUND AND APPROPRIATE ABS MODULATOR-CONTROL UNIT 25P CONNECTOR TERMINAL**).

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BODY GROUND AND APPROPRIATE ABS MODULATOR-CONTROL UNIT 25P CONNECTOR TERMINAL

DTC	ABS Modulator-control Unit 25P Connector Terminal No.	
11-13	No. 2	No. 18
13-13	No. 12	No. 3
15-13	No. 6	No. 15
17-13	No. 14	No. 5

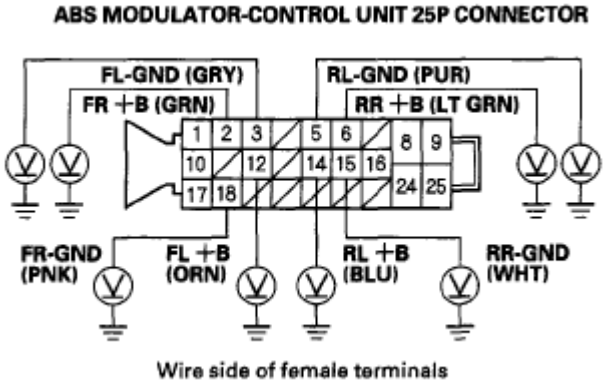

Fig. 18: Measuring Voltage Between Body Ground And Appropriate ABS Modulator-Control Unit 25P Connector Terminal

Is there 0.1 V or more?

YES - Repair short to power in the wire between the appropriate wheel sensor and the ABS modulator-control unit.

NO - Check for loose terminals in the ABS modulator-control unit 25P connector. If necessary, substitute a known-good ABS modulator-control unit: Except Si model (see **REMOVAL - EXCEPT SI MODEL**), Si model (see **REMOVAL - SI MODEL**), and retest.

DTC 12-11: RIGHT-FRONT WHEEL SENSOR ELECTRICAL NOISE OR INTERMITTENT INTERRUPTION; DTC 14-11: LEFT-FRONT WHEEL SENSOR ELECTRICAL NOISE OR INTERMITTENT INTERRUPTION; DTC 16-11: RIGHT-REAR WHEEL SENSOR ELECTRICAL NOISE OR INTERMITTENT INTERRUPTION; DTC 18-11: LEFT-REAR WHEEL SENSOR ELECTRICAL NOISE OR INTERMITTENT INTERRUPTION

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NOTE: These DTCs may be caused by electrical interference. Check for aftermarket devices installed in the vehicle when these DTCs are indicated.

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Test-drive the vehicle.
4. Check for DTCs with the HDS.

Is DTC 12-11, 14-11, 16-11, and/or 18-11 indicated?

YES - If the DTC 12-12,14-12,16-12 or 18-12 is indicated at same time, do the DTC 12-12,14-12, 16-12 or 18-12 troubleshooting (see **DTC 12-12: RIGHT-FRONT WHEEL SENSOR SHORT TO THE OTHER SENSOR CIRCUIT; DTC 14-12: LEFT-FRONT WHEEL SENSOR SHORT TO THE OTHER SENSOR CIRCUIT; DTC 16-12: RIGHT-REAR WHEEL SENSOR SHORT TO THE OTHER SENSOR CIRCUIT; DTC 18-12: LEFT-REAR WHEEL SENSOR SHORT TO THE OTHER SENSOR CIRCUIT**). If DTC 12-12,14-12,16-12 or 18-12 is not indicated, go to step 5.

NO - Troubleshoot the indicated DTC. If there are no DTCs indicated, there may be an intermittent failure, the system is OK at this time. Check for loose

terminals between the wheel sensor 2P connector and the ABS modulator-control unit 25P connector. Refer to **INTERMITTENT FAILURES TROUBLESHOOTING** .

5. Turn the ignition switch to LOCK (0).
6. Check that the appropriate wheel sensor is properly mounted (see **WHEEL SENSOR REPLACEMENT**).

WHEEL SENSOR

DTC	Appropriate Wheel Sensor
12-11	Right-front
14-11	Left-front
16-11	Right-rear
18-11	Left-rear

Is the wheel sensor installation OK?

YES - Check for loose terminals in the ABS modulator-control unit 25P connector. If necessary, substitute a known-good ABS modulator-control unit: Except Si model (see **REMOVAL - EXCEPT SI MODEL**), Si model (see **REMOVAL - SI MODEL**), and retest.

NO - Reinstall the wheel sensor, and check the mounting position (see **WHEEL SENSOR REPLACEMENT**).

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DTC 12-12: RIGHT-FRONT WHEEL SENSOR SHORT TO THE OTHER SENSOR CIRCUIT; DTC 14-12: LEFT-FRONT WHEEL SENSOR SHORT TO THE OTHER SENSOR CIRCUIT; DTC 16-12: RIGHT-REAR WHEEL SENSOR SHORT TO THE OTHER SENSOR CIRCUIT; DTC 18-12: LEFT-REAR WHEEL SENSOR SHORT TO THE OTHER SENSOR CIRCUIT

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Test-drive the vehicle. Drive the vehicle at 13 mph (20 km/h) or more, and go a distance of 328 ft (100 m) or more.

NOTE: Drive the vehicle on the road, not on the lift.

4. Check for DTCs with the HDS.

   Is DTC 12-12, 14-12, 16-12, and/or 18-12 indicated?

   YES - Go to step 5.

   NO - Intermittent failure, the system is OK at this time. Check for loose terminals between the wheel sensor 2P connector and the ABS modulator-control unit 25P connector. Refer to **INTERMITTENT FAILURES TROUBLESHOOTING** .

5. Turn the ignition switch to LOCK (0).
6. Disconnect the ABS modulator-control unit 25P connector.
7. Check for continuity between the appropriate ABS modulator-control unit 25P connector wheel sensor +B terminals (see **ABS MODULATOR-CONTROL UNIT 25P CONNECTOR WHEEL SENSOR +B TERMINALS**).

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ABS MODULATOR-CONTROL UNIT 25P CONNECTOR WHEEL SENSOR +B TERMINALS

DTC	ABS Modulator-control Unit 25P Connector Terminal No.			
	Appropriate Terminal	Other Terminals		
12-12	No. 2	No. 12	No. 6	No. 14
14-12	No. 12	No. 2	No. 6	No. 14
16-12	No. 6	No. 2	No. 12	No. 14
18-12	No. 14	No. 2	No. 12	No. 6

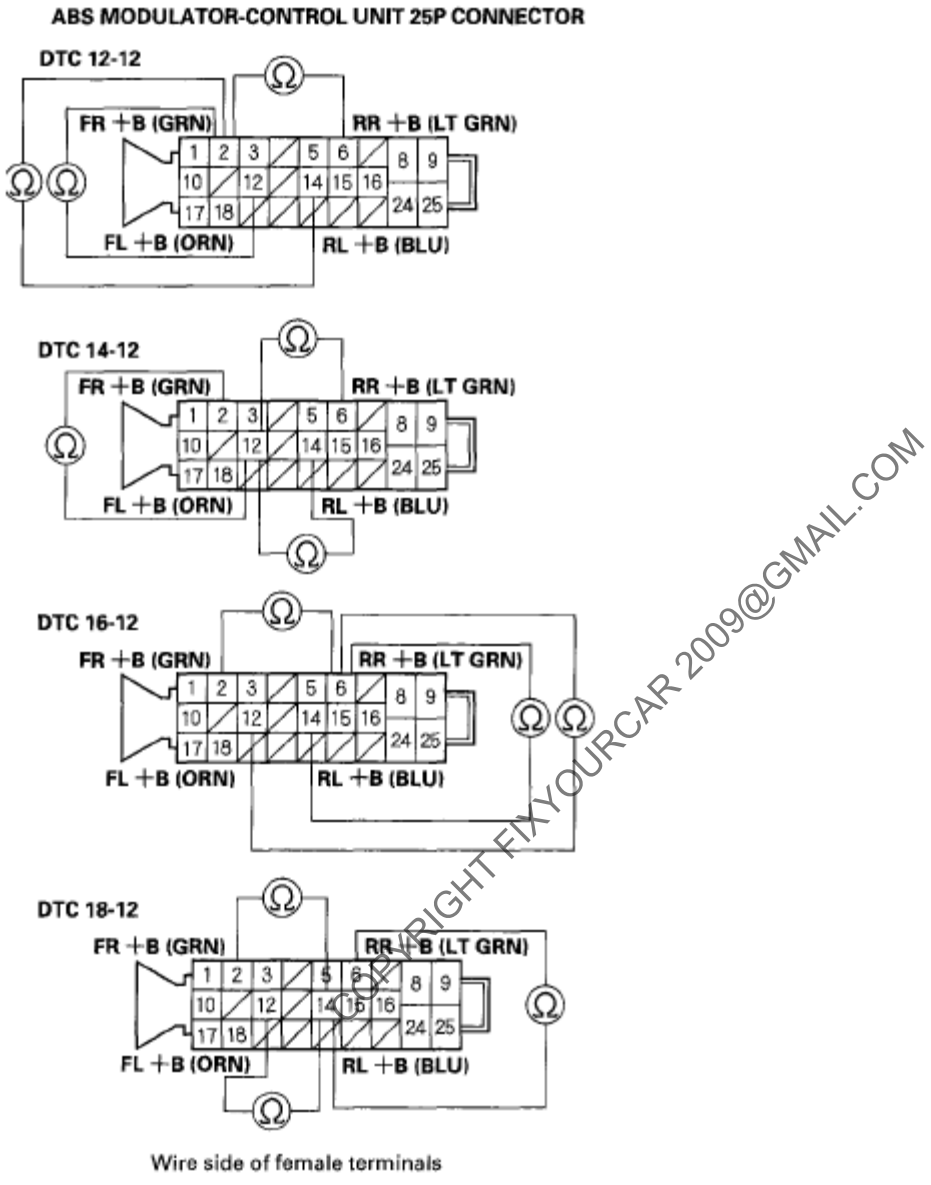

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Fig. 19: Checking Continuity Between Appropriate ABS Modulator-Control Unit 25P Connector Wheel Sensor +B Terminals

Is there continuity?

YES - Repair short in the wires between the appropriate wheel sensor and the ABS modulator-control unit.

NO - Check for loose terminals in the ABS modulator-control unit 25P connector. If necessary, substitute a known-good ABS modulator-control unit: Except Si model (see **REMOVAL - EXCEPT SI MODEL**), Si model (see

REMOVAL - SI MODEL), and retest.

DTC 12-21: RIGHT-FRONT WHEEL SENSOR INSTALLATION ERROR; DTC 14-21: LEFT-FRONT WHEEL SENSOR INSTALLATION ERROR; DTC 16-21: RIGHT-REAR WHEEL SENSOR INSTALLATION ERROR; DTC 18-21: LEFT-REAR WHEEL SENSOR INSTALLATION ERROR

1. Test-drive the vehicle. Drive the vehicle at 7 mph (10 km/h).

   NOTE: Drive the vehicle on the road, not on the lift.

2. Check the RF, LF, RR, LR WHEEL SPD in the ABS DATA LIST with the HDS.

   Are all four the same indicated value?

   YES - Intermittent failure, the system is OK at this time. Check for loose terminals between the wheel sensor 2P connector and the ABS modulator-control unit 25P connector. Refer to **INTERMITTENT FAILURES TROUBLESHOOTING** .

   NO - Go to step 3.

3. Turn the ignition switch to LOCK (0).
4. Check that the appropriate wheel sensor is properly mounted (see **WHEEL SENSOR REPLACEMENT**).

WHEEL SENSOR

DTC	Appropriate Wheel Sensor
12-21	Right-front
14-21	Left-front
16-21	Right-rear
18-21	Left-rear

Is the wheel sensor installation OK?

YES - Replace the appropriate wheel sensor (see **WHEEL SENSOR REPLACEMENT**).

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NO - Reinstall the wheel sensor, and check the mounting position (see **WHEEL SENSOR REPLACEMENT**).

DTC 12-22: RIGHT-FRONT WHEEL SENSOR INSTALLATION ERROR (19 MPH (30 KM/H) OR MORE); DTC 14-22: LEFT-FRONT WHEEL SENSOR INSTALLATION ERROR (19 MPH (30 KM/H) OR MORE); DTC 16-22: RIGHT-REAR WHEEL SENSOR INSTALLATION ERROR (19 MPH (30 KM/H) OR MORE); DTC 18-22: LEFT-REAR WHEEL SENSOR INSTALLATION ERROR (19 MPH (30 KM/H) OR MORE)

1. Test-drive the vehicle. Drive the vehicle between 19 mph (30 km/h) and 31 mph (50 km/h) for 70 seconds or more.

   NOTE: Drive the vehicle on the road, not on the lift.

2. Check the RF, LF, RR, LR WHEEL SPD in the ABS DATA LIST with the HDS.

   Are all four the same indicated value?

   YES - Intermittent failure, the system is OK at this time. Check for loose terminals between the wheel sensor 2P connector and the ABS modulator-control unit 25P connector. Refer to **INTERMITTENT FAILURES TROUBLESHOOTING** .

   NO - Go to step 3.

3. Turn the ignition switch to LOCK (0).
4. Check that the appropriate wheel sensor is properly mounted (see **WHEEL SENSOR REPLACEMENT**).

WHEEL SENSOR

DTC	Appropriate Wheel Sensor
12-22	Right-front
14-22	Left-front
16-22	Right-rear
18-22	Left-rear

Is the wheel sensor installation OK?

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YES - Replace the appropriate wheel sensor (see **WHEEL SENSOR REPLACEMENT**).

NO - Reinstall the wheel sensor, and check the mounting position (see **WHEEL SENSOR REPLACEMENT**).

DTC 12-23: RIGHT-FRONT WHEEL SENSOR INSTALLATION ERROR (0 TO 9 MPH (0 TO 15 KM/H)); DTC 14-23: LEFT-FRONT WHEEL SENSOR INSTALLATION ERROR (0 TO 9 MPH (0 TO 15 KM/H)); DTC 16-23: RIGHT-REAR WHEEL SENSOR INSTALLATION ERROR (0 TO 9 MPH (0 TO 15 KM/H)); DTC 18-23: LEFT-REAR WHEEL SENSOR INSTALLATION ERROR (0 TO 9 MPH (0 TO 15 KM/H))

1. Test-drive the vehicle. Drive the vehicle between 1 mph (1 km/h) and 9 mph (15 km/h) in a straight line.

   NOTE: Drive the vehicle on the road, not on the lift.

2. Check the RF, LF, RR, LR WHEEL SPD in the ABS DATA LIST with the HDS.

   Are all four the same indicated value?

   YES - Intermittent failure, the system is OK at this time. Check for loose terminals between the wheel sensor 2P connector and the ABS modulator-control unit 25P connector. Refer to **INTERMITTENT FAILURES TROUBLESHOOTING** .

   NO - Go to step 3.

3. Turn the ignition switch to LOCK (0).
4. Check that the appropriate wheel sensor is properly mounted (see **WHEEL SENSOR REPLACEMENT**).

WHEEL SENSOR

DTC	Appropriate Wheel Sensor
12-23	Right-front
14-23	Left-front
16-23	Right-rear

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18-23	Left-rear

Is the wheel sensor installation OK?

YES - Replace the appropriate wheel sensor (see **WHEEL SENSOR REPLACEMENT**).

NO - Reinstall the wheel sensor, and check the mounting position (see **WHEEL SENSOR REPLACEMENT**).

DTC 21-11: RIGHT-FRONT MAGNETIC ENCODER MALFUNCTION (PULSE MISSING); DTC 22-11: LEFT-FRONT MAGNETIC ENCODER MALFUNCTION (PULSE MISSING); DTC 23-11: RIGHT-REAR MAGNETIC ENCODER MALFUNCTION (PULSE MISSING); DTC 24-11: LEFT-REAR MAGNETIC ENCODER MALFUNCTION (PULSE MISSING)

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1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Test-drive the vehicle. Drive the vehicle at 13 mph (20 km/h) or more, and go a distance of 328 ft (100 m) or more.

NOTE: Drive the vehicle on the road, not on the lift.

4. Check for DTCs with the HDS.

   Is DTC 21-11,22-11,23-11, and/or 24-11 indicated?

   YES - Go to step 5.

   NO - Intermittent failure, the system is OK at this time. Check for loose terminals between the wheel sensor 2P connector and the ABS modulator-control unit 25P connector. Refer to **INTERMITTENT FAILURES TROUBLESHOOTING** .

5. Turn the ignition switch to LOCK (0).
6. Inspect the appropriate magnetic encoder for debris or cracks.

MAGNETIC ENCODER

	Appropriate	

DTC	Magnetic Encoder	Note
21-11	Right-front	Remove the driveshaft outboard joint from the appropriate wheel hub (see **KNUCKLE/HUB REPLACEMENT**).
22-11	Left-front	
23-11	Right-rear	Remove the hub bearing unit: Disc brake type (see **HUB BEARING UNIT REPLACEMENT-DISC BRAKE TYPE**), drum brake type (see **HUB BEARING UNIT REPLACEMENT-DRUM BRAKE TYPE**).
24-11	Left-rear	

Is the magnetic encoder surface OK?

YES - Replace the wheel bearing (front) or the hub bearing unit (rear):

- Front: Replace the front wheel bearing (see **KNUCKLE/HUB REPLACEMENT**).
- Rear (disc brake type): Replace the rear hub bearing unit (see **HUB BEARING UNIT REPLACEMENT-DISC BRAKE TYPE**).
- Rear (drum brake type): Replace the hub bearing unit (see **HUB BEARING UNIT REPLACEMENT-DRUM BRAKE TYPE**).

NO - Clean off dust or dirt from the appropriate magnetic encoder surface on the wheel bearing or the hub bearing unit, then go to step 1 and recheck. If the DTC is still present, replace the appropriate wheel bearing or hub bearing unit.

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DTC 31-XX*: ABS RIGHT-FRONT INLET SOLENOID VALVE MALFUNCTION; DTC 32-XX*: ABS RIGHT-FRONT OUTLET SOLENOID VALVE MALFUNCTION; DTC 33-XX*: ABS LEFT-FRONT INLET SOLENOID VALVE MALFUNCTION; DTC 34-XX*: ABS LEFT-FRONT OUTLET SOLENOID VALVE MALFUNCTION; DTC 35-XX*: ABS RIGHT-REAR INLET SOLENOID VALVE MALFUNCTION; DTC 36-XX*: ABS RIGHT-REAR OUTLET SOLENOID VALVE MALFUNCTION; DTC 37-XX*: ABS LEFT-REAR INLET SOLENOID VALVE MALFUNCTION; DTC 38-XX*: ABS LEFT-REAR OUTLET SOLENOID VALVE MALFUNCTION

*:Subcode

1. Turn the ignition switch ON (II).

2. Clear the DTC with the HDS.
3. Turn the ignition switch to LOCK (0), then turn it ON (II) again.
4. Check for DTCs with the HDS.

SOLENOID VALVE MALFUNCTION

Subcode	Malfunction	Note (DTC)
01	Solenoid Initial Pulse	31-01,32-01,33-01, 34-01,35-01,36-01, 37-01,38-01
21	Solenoid Pulse	31-21,32-21,33-21, 34-21,35-21,36-21, 37-21,38-21
22	Solenoid Speculative	31-22,32-22, 33-22, 34-22,35-22,36-22, 37-22, 38-22
23	Solenoid Stuck ON	31-23, 32-23, 33-23, 34-23, 35-23, 36-23, 37-23, 38-23

Is DTC 31-xx, 32-xx, 33-xx, 34-xx, 35-xx, 36-xx, 37-xx, or 38-xx indicated?

YES - Replace the ABS modulator-control unit: Except Si model (see **REMOVAL - EXCEPT SI MODEL**), Si model (see **REMOVAL - SI MODEL**).

NO - Intermittent failure, the system is OK at this time.

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DTC 41-21: RIGHT-FRONT WHEEL LOCK; DTC 42-21: LEFT-FRONT WHEEL LOCK; DTC 43-21: RIGHT-REAR WHEEL LOCK; DTC 44-21: LEFT-REAR WHEEL LOCK

The DTCs may be indicated under these conditions:

- The vehicle goes into a spin.
- The ABS continues to operate for a long time.
- Snow build-up on the wheel sensor.
- Misadjusted brake switch
- Contaminated brake fluid

1. Raise the vehicle, and support it with safety stands in the proper locations (see

LIFT AND SUPPORT POINTS).

2. Turn the appropriate wheel by hand.

APPROPRIATE WHEEL

DTC	Appropriate Wheel
41-21	Right-front
42-21	Left-front
43-21	Right-rear
44-21	Left-rear

Is there brake drag?

YES - Repair the brake drag.

NO - Go to step 3.

3. Check that the appropriate wheel sensor is properly mounted (see **WHEEL SENSOR REPLACEMENT**).

Is the wheel sensor installation OK?

YES - Intermittent failure, the system is OK at this time. Check for loose terminals between the wheel sensor 2P connector and the ABS modulator-control unit 25P connector. Refer to **INTERMITTENT FAILURES TROUBLESHOOTING** . If the vehicle continues to code, replace the ABS modulator-control unit: Except Si model (see **REMOVAL - EXCEPT SI MODEL**), Si model (see **REMOVAL - SI MODEL**).

NO - Reinstall the wheel sensor, and check the mounting position (see **WHEEL SENSOR REPLACEMENT**).

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DTC 51-11: MOTOR LOCK; DTC 51-13: MOTOR RELAY OFF MALFUNCTION

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Turn the ignition switch to LOCK (0), then turn it ON (II) again.

4. Wait 5 seconds.
5. Operate each SOLENOID in the ABS FUNCTION TEST five times with the HDS.
6. Check for DTCs with the HDS.

Is DTC 51-11 or 51-13 indicated?

YES - Replace the ABS modulator-control unit: Except Si model (see **REMOVAL - EXCEPT SI MODEL**), Si model (see **REMOVAL - SI MODEL**).

NO - Intermittent failure, the system is OK at this time.

DTC 51-12: MOTOR LOCK CIRCUIT MALFUNCTION

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Turn the ignition switch to LOCK (0), then turn it ON (II) again.
4. Check for DTCs with the HDS.

Is DTC 51-12 indicated?

YES - Go to step 5.

NO - Intermittent failure, the system is OK at this time. Check for loose terminals at the ABS modulator-control unit 25P connector. Refer to **INTERMITTENT FAILURES TROUBLESHOOTING** .

5. Turn the ignition switch to LOCK (0).
6. Check the No. 3 MTR (30 A) fuse in the under-hood fuse/relay box.

Is the fuse blown?

YES - Go to step 7.

NO - Reinstall the checked fuse, then go to step 9.

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7. Disconnect the ABS modulator-control unit 25P connector.
8. Check for continuity between ABS modulator-control unit 25P connector terminal No. 9 and body ground.

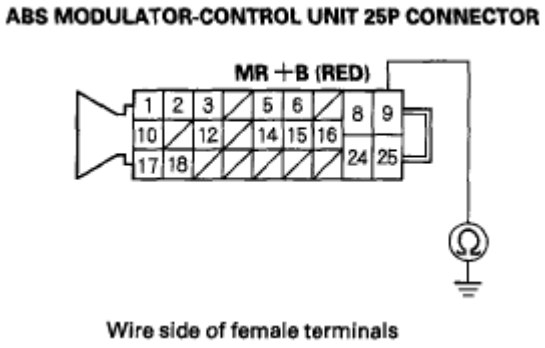

Fig. 20: Checking Continuity Between ABS Modulator-Control Unit 25P Connector Terminal No. 9 And Body Ground

Is there continuity?

YES - Repair short to body ground in the wire between the No. 3 MTR (30 A) fuse in the understood fuse/relay box and the ABS modulator-control unit.

NO - Install a new No. 3 MTR (30 A) fuse in the under-hood fuse/relay box, then go to step 10.

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9. Disconnect the ABS modulator-control unit 25P connector.
10. Measure voltage between ABS modulator-control unit 25P connector terminal No. 9 and body ground.

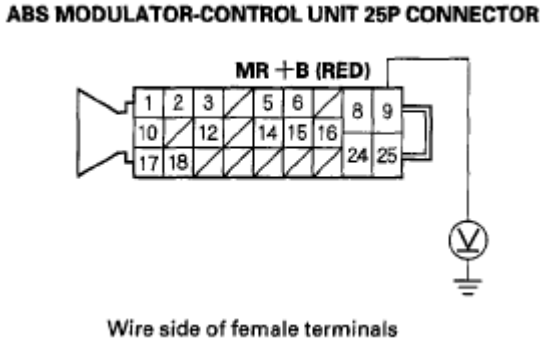

Fig. 21: Measuring Voltage Between ABS Modulator-Control Unit 25P

Connector Terminal No. 9 And Body Ground

Is there battery voltage?

YES - Check for loose terminals in the ABS modulator-control unit 25P connector. If necessary, substitute a known-good ABS modulator-control unit: Except Si model (see **REMOVAL - EXCEPT SI MODEL**), Si model (see **REMOVAL - SI MODEL**), and retest.

NO - Repair open in the wire between the No. 3 MTR (30 A) fuse in the under-hood fuse/relay box and the ABS modulator-control unit.

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DTC 52-12: MOTOR STUCK OFF

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Turn the ignition switch to LOCK (0), then turn it ON (II) again.
4. Operate each SOLENOID in the ABS FUNCTION TEST five times with the HDS.
5. Check for DTCs with the HDS.

Is DTC 52-12 indicated?

YES - Replace the ABS modulator-control unit: Except Si model (see **REMOVAL - EXCEPT SI MODEL**), Si model (see **REMOVAL - SI MODEL**).

NO - Intermittent failure, the system is OK at this time.

DTC 53-01: MOTOR RELAY STUCK ON 1; DTC 53-12: MOTOR RELAY STUCK ON 2

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Turn the ignition switch to LOCK (0), then turn it ON (II) again.
4. Check for DTCs with the HDS.

Is DTC 53-01 or 53-12 indicated?

YES - Go to step 5.

NO - Intermittent failure, the system is OK at this time. Check for loose terminals at the ABS modulator-control unit 25P connector. Refer to **INTERMITTENT FAILURES TROUBLESHOOTING** .

5. Turn the ignition switch to LOCK (0).
6. Disconnect the ABS modulator-control unit 25P connector.
7. Check for continuity between ABS modulator-control unit 25P connector terminal No. 25 and body ground.

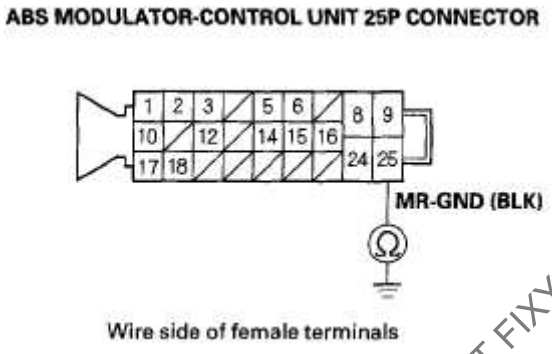

Fig. 22: Checking Continuity Between ABS Modulator-Control Unit 25P Connector Terminal No. 25 And Body Ground

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Is there continuity?

YES - Check for loose terminals in the ABS modulator-control unit 25P connector. If necessary, substitute a known-good ABS modulator-control unit: Except Si model (see **REMOVAL - EXCEPT SI MODEL**), Si model (see **REMOVAL - SI MODEL**), and retest.

NO - Repair open in the wire between the ABS modulator-control unit and body ground (G202).

DTC 54-03: FAIL-SAFE RELAY 1 STUCK ON

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Turn the ignition switch to LOCK (0), then turn it ON (II) again.

4. Check for DTCs with the HDS.

   Is DTC 54-03 indicated?

   YES - Replace the ABS modulator-control unit: Except Si model (see **REMOVAL - EXCEPT SI MODEL**), Si model (see **REMOVAL - SI MODEL**).

   NO - Intermittent failure, the system is OK at this time.

DTC 54-04: FAIL-SAFE RELAY 1 STUCK OFF (INITIAL); DTC 54-21: FAIL-SAFE RELAY 1 STUCK OFF (MAIN)

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1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Turn the ignition switch to LOCK (0), then turn it ON (II) again.
4. Check for DTCs with the HDS.

   Is DTC 54-04 or 54-21 indicated?

   YES - Go to step 5.

   NO - Intermittent failure, the system is OK at this time. Check for loose terminals at the ABS modulator-control unit 25P connector. Refer to **INTERMITTENT FAILURES TROUBLESHOOTING** (see).

5. Turn the ignition switch to LOCK (0).
6. Check the No. 3 FSR (30 A) fuse in the under-hood fuse/relay box.

   Is the fuse blown?

   YES - Go to step 7.

   NO - Reinstall the checked fuse, then go to step 9.

7. Disconnect the ABS modulator-control unit 25P connector.
8. Check for continuity between ABS modulator-control unit 25P connector

terminal No. 8 and body ground.

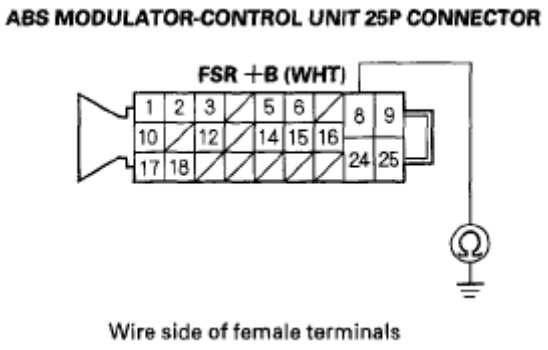

Fig. 23: Checking Continuity Between ABS Modulator-Control Unit 25P Connector Terminal No. 8 And Body Ground

Is there continuity?

YES - Repair short to body ground in the wire between the No. 3 FSR (30 A) fuse in the under-hood fuse/relay box and the ABS modulator-control unit.

NO - Install a new No. 3 FSR (30 A) fuse in the under-hood fuse/relay box, then go to step 10.

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9. Disconnect the ABS modulator-control unit 25P connector.
10. Measure voltage between ABS modulator-control unit 25P connector terminal No. 8 and body ground.

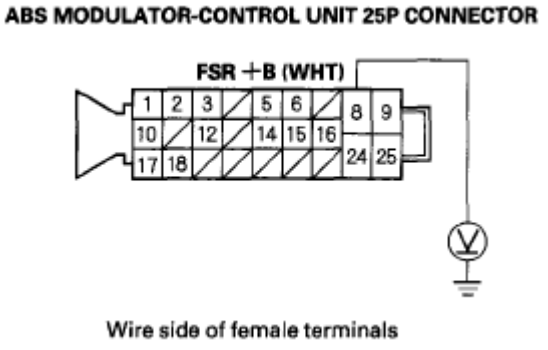

Fig. 24: Measuring Voltage Between ABS Modulator-Control Unit 25P Connector Terminal No. 8 And Body Ground

Is there battery voltage?

YES - Check for loose terminals in the ABS modulator-control unit 25P connector. If necessary, substitute a known-good ABS modulator-control unit: Except Si model (see **REMOVAL - EXCEPT SI MODEL**), Si model (see **REMOVAL - SI MODEL**), and retest.

NO - Repair open in the wire between the No. 3 FSR (30 A) fuse in the under-hood fuse/relay box and the ABS modulator-control unit.

DTC 61-01: MODULATOR-CONTROL UNIT INITIAL IG LOW VOLTAGE; DTC 61-21: MODULATOR-CONTROL UNIT POWER SOURCE LOW VOLTAGE 1; DTC 61-22: MODULATOR-CONTROL UNIT POWER SOURCE LOW VOLTAGE 2; DTC 61-23: MODULATOR-CONTROL UNIT POWER SOURCE LOW VOLTAGE 3

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1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Turn the ignition switch to LOCK (0), then start the engine.
4. Check for DTCs with the HDS.

   Is DTC 61-01, 61-21, 61-22, or 61-23 indicated?

   YES - Go to step 5.

   NO - Intermittent failure, the system is OK at this time. Check for loose terminals at the ABS modulator-control unit 25P connector. Refer to **INTERMITTENT FAILURES TROUBLESHOOTING** .

5. Check and note BATTERY voltage in the ABS DATA LIST with the HDS. If the voltage listed is 0 V, go to step 8, otherwise go to step 6.
6. Using a voltmeter, measure and note the voltage between the battery terminals.

   NOTE: If the voltage is below 9.5 V, check the battery (see BATTERY TEST), and troubleshoot the alternator regulator circuit: Except Si model (see ALTERNATOR AND REGULATOR CIRCUIT TROUBLESHOOTING), Si model (see ALTERNATOR AND REGULATOR CIRCUIT TROUBLESHOOTING).

7. Compare the voltage noted in step 5 to the voltage in step 6.

   Is the difference between the two voltage readings less then 3 V?

   YES - Intermittent failure, the system is OK at this time. Check for loose terminals at the ABS modulator-control unit 25P connector. Refer to **INTERMITTENT FAILURES TROUBLESHOOTING** . If the code resets after clearing, replace the ABS modulator-control unit: Except Si model (see **REMOVAL - EXCEPT SI MODEL**), Si model (see **REMOVAL - SI MODEL**).

   NO - Check for loose terminals in the ABS modulator-control unit 25P connector. If necessary, substitute a known-good ABS modulator-control unit: Except Si model (see **REMOVAL - EXCEPT SI MODEL**), Si model (see **REMOVAL - SI MODEL**), and retest.

8. Turn the ignition switch to LOCK (0).
9. Disconnect the ABS modulator-control unit 25P connector.
10. Measure voltage between ABS modulator-control unit 25P connector terminal No. 8 and body ground.

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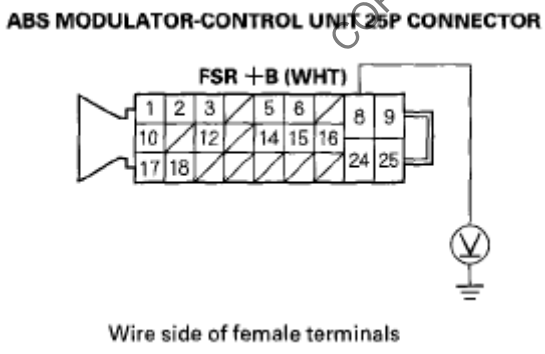

Fig. 25: Measuring Voltage Between ABS Modulator-Control Unit 25P Connector Terminal No. 8 And Body Ground

Is there battery voltage?

YES - Go to step 11.

NO - Repair open in the wire between the No. 3 FSR (30 A) fuse in the under-

hood fuse/relay box and the ABS modulator-control unit.

11. Turn the ignition switch ON (II).
12. Measure voltage between ABS modulator-control unit 25P connector terminal No. 16 and body ground.

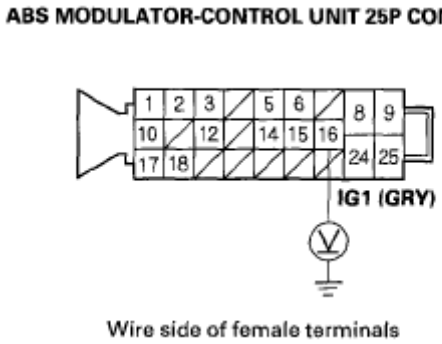

Fig. 26: Measuring Voltage Between ABS Modulator-Control Unit 25P Connector Terminal No. 16 And Body Ground

Is there battery voltage?

YES - Check for loose terminals in the ABS modulator-control unit 25P connector. If necessary, substitute a known-good ABS modulator-control unit: Except Si model (see **REMOVAL - EXCEPT SI MODEL**), Si model (see **REMOVAL - SI MODEL**), and retest.

NO - Repair open in the wire between the No. 4 (7.5 A) fuse in the under-dash fuse/relay box and the ABS modulator-control unit.

DTC 62-21: MODULATOR-CONTROL UNIT IG HIGH VOLTAGE

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Turn the ignition switch to LOCK (0), then start the engine.
4. Check for DTCs with the HDS.

Is DTC 62-21 indicated?

YES - Go to step 5.

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NO - Intermittent failure, the system is OK at this time.

5. Using a voltmeter, measure the voltage between the battery terminals. Compare the voltage measured at the battery with the voltage shown in the ABS DATA LIST with the HDS.

   Is there a voltage difference of 3 V or more?

   YES - Replace the ABS modulator-control unit: Except Si model (see **REMOVAL - EXCEPT SI MODEL**), Si model (see **REMOVAL - SI MODEL**), and retest.

   NO - Check the battery (see **BATTERY TEST**), and troubleshoot the alternator regulator circuit: Except Si model (see **ALTERNATOR AND REGULATOR CIRCUIT TROUBLESHOOTING**), Si model (see **ALTERNATOR AND REGULATOR CIRCUIT TROUBLESHOOTING**). Also check for loose terminals in the ABS modulator-control unit 25P connector. If it is OK, replace the ABS modulator-control unit: Except Si model (see **REMOVAL - EXCEPT SI MODEL**), Si model (see **REMOVAL - SI MODEL**).

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DTC 71-21: RIGHT-FRONT OR LEFT-REAR DIFFERENT DIAMETER TIRE MALFUNCTION;
DTC 71-22: LEFT-FRONT OR RIGHT-REAR DIFFERENT DIAMETER TIRE MALFUNCTION;
DTC 71-23: RIGHT-FRONT AND RIGHT-REAR DIFFERENT DIAMETER TIRE MALFUNCTION;
DTC 71-24: LEFT-FRONT AND LEFT-REAR DIFFERENT DIAMETER TIRE MALFUNCTION;
DTC 71-25: RIGHT-FRONT AND LEFT-FRONT DIFFERENT DIAMETER TIRE MALFUNCTION;
DTC 71-26: RIGHT-REAR AND LEFT-REAR DIFFERENT DIAMETER TIRE MALFUNCTION

NOTE: The DTC will be indicated when the vehicle has a different diameter tire(s) compared to the other tire(s).

DIFFERENT DIAMETER TIRE MALFUNCTION

DTC	Sectional	Note
71-21	Right-front or left-rear	
71-22	Left-front or right-rear	
71-23	Right-front and right-rear	
71-24	Left-front and left-rear	

71-25	Right-front and left-front	
71-26	Right-rear and left-rear	

1. Check the tires for proper inflation (see **WHEEL ALIGNMENT**).
2. Turn the ignition switch ON (II).
3. Clear the DTC with the HDS.
4. Turn the ignition switch to LOCK (0).
5. Test-drive the vehicle.
6. Check for DTCs with the HDS.

   Is DTC 71-21, 71-22, 71-23, 71-24, 71-25, or 71-26 indicated?

   YES - Replace all four tires with the proper size (see **WHEEL ALIGNMENT**).

   NO - Intermittent failure, the system is OK at this time.

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DTC 81-XX*: CENTRAL PROCESSING UNIT (CPU) INTERNAL CIRCUIT MALFUNCTION

* : Subcode (Except DTC 81-11, 81-51, and 81-52)

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Turn the ignition switch to LOCK (0), then turn it ON (II) again.
4. Check for DTCs with the HDS.

   Is DTC 81-xx indicated?

   YES - If the DTC 81-11, 81-51, or 81-52 is indicated at the same time, do the DTC 81-11,81-51, or 81-52 troubleshooting (see **DTC 81-xx*: Central Processing Unit (CPU) Internal Circuit Malfunction**). If DTC 81-11, 81-51, or 81-52 is not indicated, replace the ABS modulator-control unit: Except Si model (see **REMOVAL - EXCEPT SI MODEL**), Si model (see **REMOVAL - SI MODEL**), and retest.

   NO - Intermittent failure, the system is OK at this time.

DTC 81-11: CENTRAL PROCESSING UNIT (CPU) INTERNAL CIRCUIT MALFUNCTION; DTC 81-51: CENTRAL PROCESSING UNIT (CPU) INTERNAL CIRCUIT MALFUNCTION; DTC 81-52: CENTRAL PROCESSING UNIT (CPU) INTERNAL CIRCUIT MALFUNCTION

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Turn the ignition switch to LOCK (0).
4. Test-drive the vehicle.
5. Check for DTCs with the HDS.

   Is DTC 81-11, 81-51, or 81-52 indicated?

   YES - Replace the ABS modulator-control unit: Except Si model (see **REMOVAL - EXCEPT SI MODEL**), Si model (see **REMOVAL - SI MODEL**).

   NO - Intermittent failure, the system is OK at this time.

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DTC 86-01: F-CAN BUS-OFF MALFUNCTION

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Turn the ignition switch to LOCK (0), then turn it ON (II) again.
4. Check for DTCs with the HDS.

   Is DTC 86-01 indicated?

   YES - Go to step 5.

   NO - Intermittent failure, the system is OK at this time. Check for loose terminals between ECM/PCM connector A (44P) and the ABS modulator-control unit 25P connector. Refer to **INTERMITTENT FAILURES TROUBLESHOOTING** .

5. Turn the ignition switch to LOCK (0).
6. Short the SCS line with the HDS.
7. Disconnect ECM/PCM connector A (44P).

8. Disconnect the HDS from the data link connector (DLC).
9. Disconnect the gauge control module (tach) 36P connector.
10. Disconnect SRS unit connector A (28P).
11. With EPS: Disconnect EPS control unit connector D (28P).
12. With TPMS: Disconnect the TPMS control unit 20P connector.
13. Disconnect the ABS modulator-control unit 25P connector.
14. Check for continuity between the ABS modulator-control unit 25P connector terminals No. 1 and No. 17 and body ground individually.

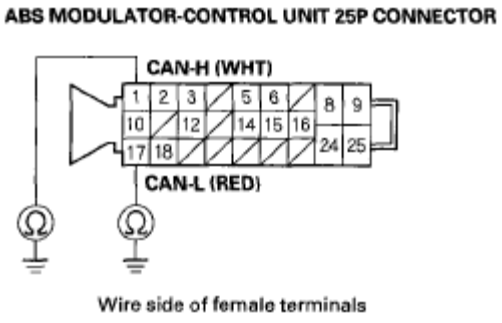

Fig. 27: Checking Continuity Between ABS Modulator-Control Unit 25P Connector Terminals No. 1 And No. 17 And Body Ground

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Is there continuity?

YES - Repair short to body ground in the wire between the ECM/PCM, the gauge control module (tach), the data link connector (DLC), the SRS unit, the EPS control unit (if equipped), the TPMS control unit (if equipped), and the ABS modulator-control unit.

NO - Go to step 15.

15. Check for continuity between body ground and the ABS modulator-control unit 25P connector terminals No. 1 and No. 17 individually.

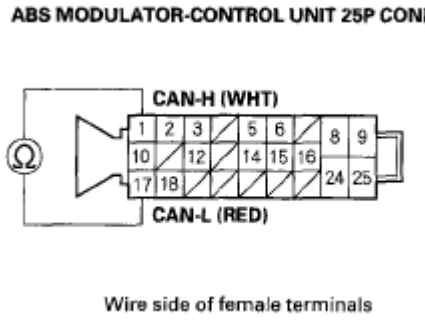

Fig. 28: Checking Continuity Between ABS Modulator-Control Unit 25P Connector Terminals No. 1 And No. 17

Is there continuity?

YES - Repair short in the wires between ABS modulator-control unit 25P connector terminals No. 1 (CAN-H line) and No. 17 (CAN-L line).

NO - Go to step 16.

16. Check for continuity between ABS modulator-control unit 25P connector terminal and ECM/PCM connector A (44P) terminal (see **ABS MODULATOR-CONTROL UNIT 25P CONNECTOR TERMINAL AND ECM/PCM CONNECTOR A (44P) TERMINAL**).

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ABS MODULATOR-CONTROL UNIT 25P CONNECTOR TERMINAL AND ECM/PCM CONNECTOR A (44P) TERMINAL

Sign	Connector Terminal No.	
	ABS Modulator-control Unit	ECM/PCM
CAN-L	17	37
CAN-H	1	36

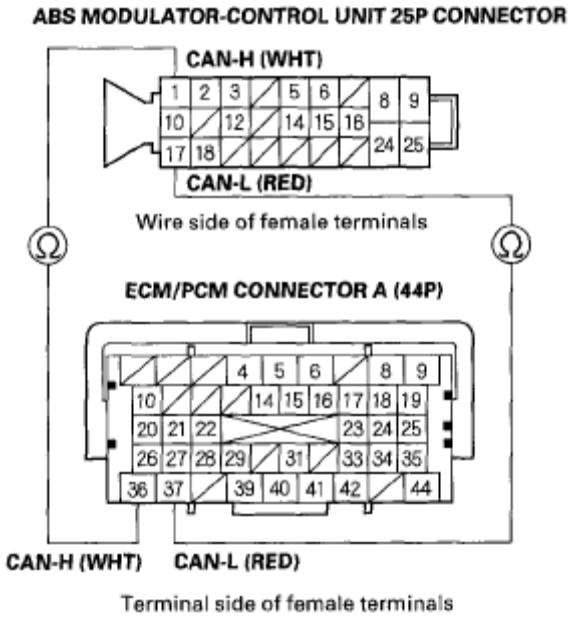
ABS MODULATOR-CONTROL UNIT 25P CONNECTOR
CAN-H (WHT)
1 2 3 5 6 8 9
10 12 14 15 16 24 25
17 18
CAN-L (RED)
Wire side of female terminals
ECM/PCM CONNECTOR A (44P)
4 5 6 8 9
10 14 15 16 17 18 19
20 21 22 23 24 25
26 27 28 29 31 33 34 35
36 37 39 40 41 42 44
CAN-H (WHT)
CAN-L (RED)
Terminal side of female terminals

Fig. 29: Checking Continuity Between ABS Modulator-Control Unit 25P Connector Terminal And ECM/PCM Connector A (44P) Terminal

Is there continuity?

YES - Check for loose terminals in the ABS modulator-control unit 25P connector. If necessary, substitute a known-good ABS modulator-control unit: Except Si model (see **REMOVAL - EXCEPT SI MODEL**), Si model (see **REMOVAL - SI MODEL**), and retest.

NO - Repair open in the wire between the ECM/PCM and the ABS modulator-control unit.

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DTC 86-24: F-CAN COMMUNICATION WITH ENGINE MALFUNCTION; DTC 86-25: F-CAN COMMUNICATION WITH ENGINE MALFUNCTION

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Turn the ignition switch to LOCK (0).
4. Test-drive the vehicle. Drive the vehicle at 7 mph (10 km/h) or more.
5. Check for DTCs with the HDS.

Is 86-24, and/or 86-25 DTC indicated?

YES - Go to step 6.

NO - Intermittent failure, the system is OK at this time. Check for loose terminals between ECM/PCM connector A (44P) and the ABS modulator-control unit 25P connector. Refer to **INTERMITTENT FAILURES TROUBLESHOOTING** .

6. Turn the ignition switch to LOCK (0).
7. Short the SCS line with the HDS.
8. Disconnect ECM/PCM connector A (44P).
9. Disconnect the ABS modulator-control unit 25P connector.
10. Check for continuity between ABS modulator-control unit 25P connector terminal and ECM/PCM connector A (44P) terminal (see **ABS MODULATOR-CONTROL UNIT 25P CONNECTOR TERMINAL AND ECM/PCM CONNECTOR A (44P) TERMINAL**).

ABS MODULATOR-CONTROL UNIT 25P CONNECTOR TERMINAL AND ECM/PCM CONNECTOR A (44P) TERMINAL

Sign	Connector Terminal No.	
	ABS Modulator-control Unit	ECM/PCM
CAN-L	17	37
CAN-H	1	36

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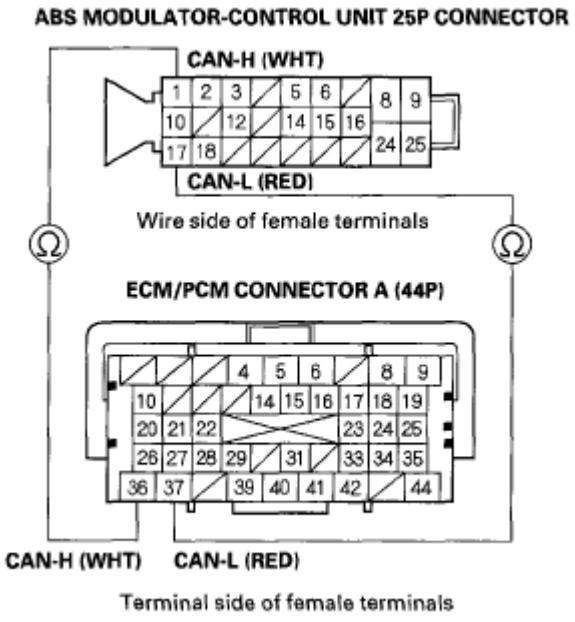
ABS MODULATOR-CONTROL UNIT 25P CONNECTOR
CAN-H (WHT)
1 2 3 5 6 8 9
10 12 14 15 16 24 25
17 18
CAN-L (RED)
Wire side of female terminals
ECM/PCM CONNECTOR A (44P)
4 5 6 8 9
10 14 15 16 17 18 19
20 21 22 23 24 25
26 27 28 29 31 33 34 35
36 37 39 40 41 42 44
CAN-H (WHT)
CAN-L (RED)
Terminal side of female terminals

Fig. 30: Checking Continuity Between ABS Modulator-Control Unit 25P Connector Terminal And ECM/PCM Connector A (44P) Terminal

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Is there continuity?

YES - Check for loose terminals in ECM/PCM connector A (44P) and at ABS modulator-control unit 25P connector. If necessary, substitute a known-good ECM/PCM, then go to step 1 and recheck. If no DTCs are indicated, replace the original ECM/PCM: Except Si model (see **ECM/PCM REPLACEMENT**), Si model (see **ECM REPLACEMENT**). If DTCs are indicated, replace the ABS modulator-control unit: Except Si model (see **REMOVAL - EXCEPT SI MODEL**), Si model (see **REMOVAL - SI MODEL**).

NO - Repair open in the wire between the ECM/PCM and the ABS modulator-control unit.

DTC 86-FF: F-CAN COMMUNICATION WITH ABS MALFUNCTION

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Turn the ignition switch to LOCK (0), then turn it ON (II) again.
4. Check for DTCs with the HDS.

Is DTC 86-FF Indicated?

YES - Replace the ABS modulator-control unit: Except Si model (see **REMOVAL - EXCEPT SI MODEL**), Si model (see **REMOVAL - SI MODEL**).

NO - Intermittent failure, the system is OK at this time.

SYMPTOM TROUBLESHOOTING

ABS INDICATOR DOES NOT GO OFF, AND NO DTCS ARE STORED

1. Check for the communication between the vehicle and the HDS.

   Is there the communication?

   YES - Check for loose terminals in the gauge control module (tach) 36P connector. If necessary, substitute a known-good gauge control module (tach), then recheck. If it is OK, replace the original gauge control module (tach) (see **TACHOMETER**).

   NO - If the HDS does not communicate with all the systems of the vehicle, troubleshoot the DLC circuit: Except Si model (see **DLC CIRCUIT TROUBLESHOOTING**), Si model (see **DLC CIRCUIT TROUBLESHOOTING**). If the HDS does not communicate with only ABS, go to step 2.

2. Turn the ignition switch to LOCK (0).
3. Check the No. 4 (7.5 A) fuse in the under-dash fuse/relay box.

   Is the fuse blown?

   YES - Install the new No. 4 (7.5 A) fuse, and recheck. If the fuse continues to blow, check for short to body ground in the wire between the No. 4 (7.5 A) fuse in the under-dash fuse/relay box and the ABS modulator-control unit. If necessary, substitute a known-good ABS modulator-control unit: Except Si model (see **REMOVAL - EXCEPT SI MODEL**), Si model (see **REMOVAL - SI MODEL**), and retest.

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NO - Reinstall a checked fuse, then go to step 4.

4. Disconnect the ABS modulator-control unit 25P connector.
5. Turn the ignition switch ON (II).
6. Measure voltage between ABS modulator-control unit 25P connector terminal No. 16 and body ground.

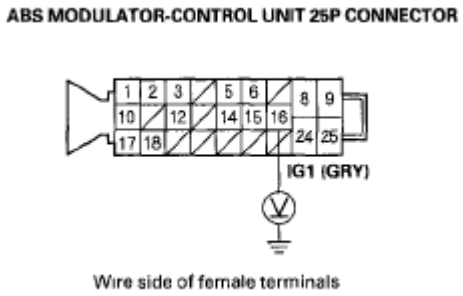

Fig. 31: Measuring Voltage Between ABS Modulator-Control Unit 25P Connector Terminal No. 16 And Body Ground

Is there battery voltage?

YES - Go to step 7.

NO - Repair open in the wire between the No. 4 (7.5 A) fuse in the under-dash fuse/relay box and the ABS modulator-control unit.

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7. Turn the ignition switch to LOCK (0).
8. Check for continuity between ABS modulator-control unit 25P connector terminal No. 24 and body ground.

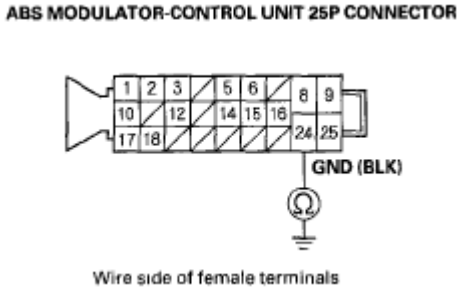

Fig. 32: Checking Continuity Between ABS Modulator-Control Unit 25P Connector Terminal No. 24 And Body Ground

Is there continuity?

YES - Check for loose terminals in the ABS modulator-control unit 25P connector, clean terminal G202 and recheck. If necessary, substitute a known-good ABS modulator-control unit: Except Si model (see **REMOVAL - EXCEPT SI MODEL**), Si model (see **REMOVAL - SI MODEL**), and retest.

NO - Repair open in the wire between the ABS modulator-control unit and body ground (G202).

BRAKE SYSTEM INDICATOR DOES NOT GO OFF, AND NO DTCS ARE STORED

1. Release the parking brake.
2. Turn the ignition switch ON (II).
3. Check the brake system indicator for several seconds when the ignition switch is turned ON (II).

Does the indicator come on then go off?

YES - Intermittent failure, the system is OK at this time. Check for loose terminals between the gauge control module (tach) 36P connector and the ABS modulator-control unit 25P connector. Refer to **INTERMITTENT FAILURES TROUBLESHOOTING** .

NO - Go to step 4.

4. Check the BRAKE INDICATOR in the ABS DATA LIST with the HDS.

Does it indicate OFF?

YES - Go to step 5.

NO - Check for loose terminals in the ABS modulator-control unit 25P connector. If necessary, substitute a known-good ABS modulator-control unit: Except Si model (see **REMOVAL - EXCEPT SI MODEL**), Si model (see **REMOVAL - SI MODEL**), and retest.

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5. Turn the ignition switch to LOCK (0).
6. Check the brake fluid level in the master cylinder reservoir tank.

   Is brake fluid level OK?

   YES - Go to step 7.

   NO - Do the brake pad inspection: Front (except Si model) (see **INSPECTION - EXCEPT SI MODEL**), front (Si model) (see **INSPECTION - SI MODEL**), rear (disc brake type) (see **REAR BRAKE PAD INSPECTION AND REPLACEMENT**), and add the brake fluid, then go to step 1 and recheck.

7. Disconnect the brake fluid level switch 2P connector.
8. Turn the ignition switch ON (II).

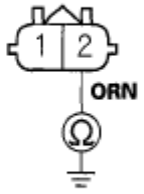
   Does the brake system indicator go off?

   YES - Replace the brake fluid reservoir tank (brake fluid level switch is included) (see **MASTER CYLINDER INSPECTION**).

   NO - Go to step 9.

9. Turn the ignition switch to LOCK (0).
10. Disconnect the gauge control module (tach) 36P connector.
11. Check for continuity between brake fluid level switch 2P connector terminal No. 2 and body ground.

BRAKE FLUID LEVEL SWITCH 2P CONNECTOR



Wire side of female terminals

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Fig. 33: Checking Continuity Between Brake Fluid Level Switch 2P Connector Terminal No. 2 And Body Ground

Is there continuity?

YES - Repair short to body ground in the wire between the gauge control module (tach) and the brake fluid level switch.

NO - Go to step 12.

12. Reconnect the gauge control module (tach) 36P connector.
13. Disconnect the parking brake switch IP connector.
14. Turn the ignition switch ON (II).

Does the brake system indicator go off?

YES - Replace the parking brake switch (see **PARKING BRAKE CABLE REPLACEMENT**).

NO - Go to step 15.

15. Turn the ignition switch to LOCK (0).
16. Disconnect the gauge control module (tach) 36P connector.
17. Check for continuity between parking brake switch 1P connector terminal No. 1 and body ground.

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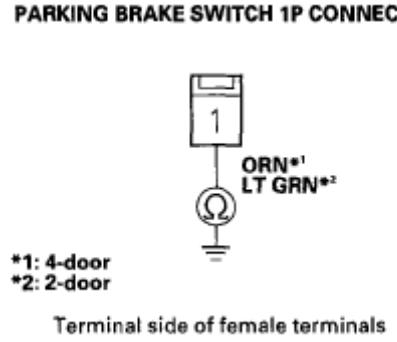

Fig. 34: Checking Continuity Between Brake Fluid Level Switch 2P Connector Terminal No. 1 And Body Ground

Is there continuity?

YES - Repair short to body ground in the wire between the gauge control module (tach) and the parking brake switch.

NO - Check for loose terminals in the gauge control module (tach) 36P connector. If necessary, substitute a known-good gauge control module (tach), then go to step 1 and recheck. If it is OK, replace the original gauge control module (tach) (see **TACHOMETER**).

ABS INDICATOR AND BRAKE SYSTEM INDICATOR DO NOT GO OFF AT THE SAME TIME

NOTE: Check for gauge DTCs with the HDS (see HOW TO CHECK FOR DTCS WITH THE HONDA DIAGNOSTIC SYSTEM (HDS)). If gauge DTCs are stored, troubleshoot those DTCs first.

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1. Release the parking brake.
2. Turn the ignition switch ON (II).
3. Check the ABS indicator and the brake system indicator for several seconds when the ignition switch is turned ON (II).

   Do the indicators come on then go off?

   YES - Intermittent failure, the system is OK at this time. Check for loose terminals between the gauge control module (tach) 36P connector and the ABS modulator-control unit 25P connector. Refer to **INTERMITTENT FAILURES TROUBLESHOOTING** .

   NO - Go to step 4.

4. Turn the ignition switch to LOCK (0).
5. Short the SCS line with the HDS.
6. Disconnect ECM/PCM connector A (44P).
7. Disconnect the HDS from the data link connector (DLC).
8. Disconnect the gauge control module (tach) 36P connector.

9. Disconnect SRS unit connector A (28P).
10. With EPS: Disconnect EPS control unit connector D (28P).
11. With TPMS: Disconnect the TPMS control unit 20P connector.
12. Disconnect the ABS modulator-control unit 25P connector.
13. Check for continuity between the ABS modulator-control unit 25P connector terminals No. 1, and No. 17 and body ground individually.

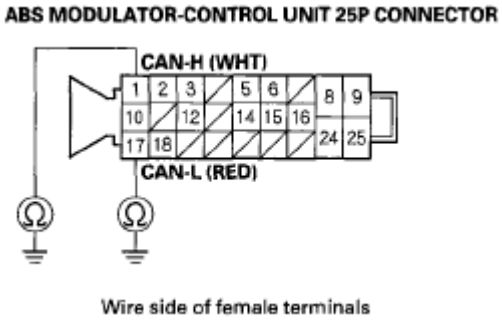

Fig. 35: Checking Continuity Between ABS Modulator-Control Unit 25P Connector Terminals No. 1 & No. 17 And Body Ground

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Is there continuity?

YES - Repair short to body ground in the wire between the ECM/PCM, the gauge control module (tach), the data link connector (DLC), the SRS unit, the EPS control unit (if equipped), the TPMS control unit (if equipped), and the ABS modulator-control unit.

NO - Go to step 14.

14. Check for continuity between ABS modulator-control unit 25P connector terminals No. 1 and No. 17.

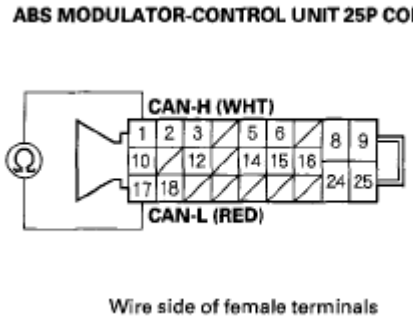

Fig. 36: Checking Continuity Between ABS Modulator-Control Unit 25P Connector Terminals No. 1 And No. 17

Is there continuity?

YES - Repair short in the wire between ABS modulator-control unit 25P connector terminals No. 1 (CAN-H line) and No. 17 (CAN-L line).

NO - Go to step 15.

15. Check for continuity between ABS modulator-control unit 25P connector terminal and gauge control module (tach) 36P connector terminal (see table).

ABS MODULATOR-CONTROL UNIT 25P CONNECTOR TERMINAL AND GAUGE CONTROL MODULE (TACH) 36P CONNECTOR TERMINAL

Sign	Connector Terminal No.	
	ABS Modulator-control Unit	Gauge Control Module (Tach)
CAN-L	17	19
CAN-H	1	1

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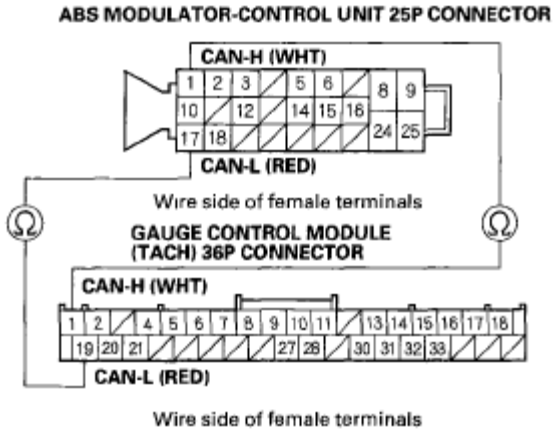
ABS MODULATOR-CONTROL UNIT 25P CONNECTOR
CAN-H (WHT)
1 2 3 5 6 8 9
10 12 14 15 16 24 25
17 18
CAN-L (RED)
Wire side of female terminals
GAUGE CONTROL MODULE (TACH) 36P CONNECTOR
CAN-H (WHT)
1 2 4 5 6 7 8 9 10 11 13 14 15 16 17 18
19 20 21 27 28 30 31 32 33
CAN-L (RED)
Wire side of female terminals

Fig. 37: Checking Continuity Between ABS Modulator-Control Unit 25P Connector Terminal And Gauge Control Module (Tach) 36P Connector Terminal

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Is there continuity?

YES - Check for loose terminals in the gauge control module (tach) 36P connector. If necessary, substitute a known-good gauge control module (tach), then go to step 1 and recheck. If it is OK, replace the original gauge control module (tach) (see **TACHOMETER**). If DTCs are indicated, replace the ABS modulator-control unit: Except Si model (see **REMOVAL - EXCEPT SI MODEL**), Si model (see **REMOVAL - SI MODEL**).

NO - Repair open in the wire between the gauge control module (tach) and the ABS modulator-control unit.

ABS MODULATOR-CONTROL UNIT REMOVAL AND INSTALLATION

NOTE:

- **Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid gets on the paint, wash it off immediately with water.**
- **Be careful not to damage or deform the brake lines during removal and installation.**
- **To prevent the brake fluid from flowing, plug and cover the hose ends and joints with a shop towel or equivalent material.**

REMOVAL - EXCEPT SI MODEL

1. Disconnect the ABS modulator-control unit 25P connector (A) by pulling up the lock (B); the connector disconnects itself.

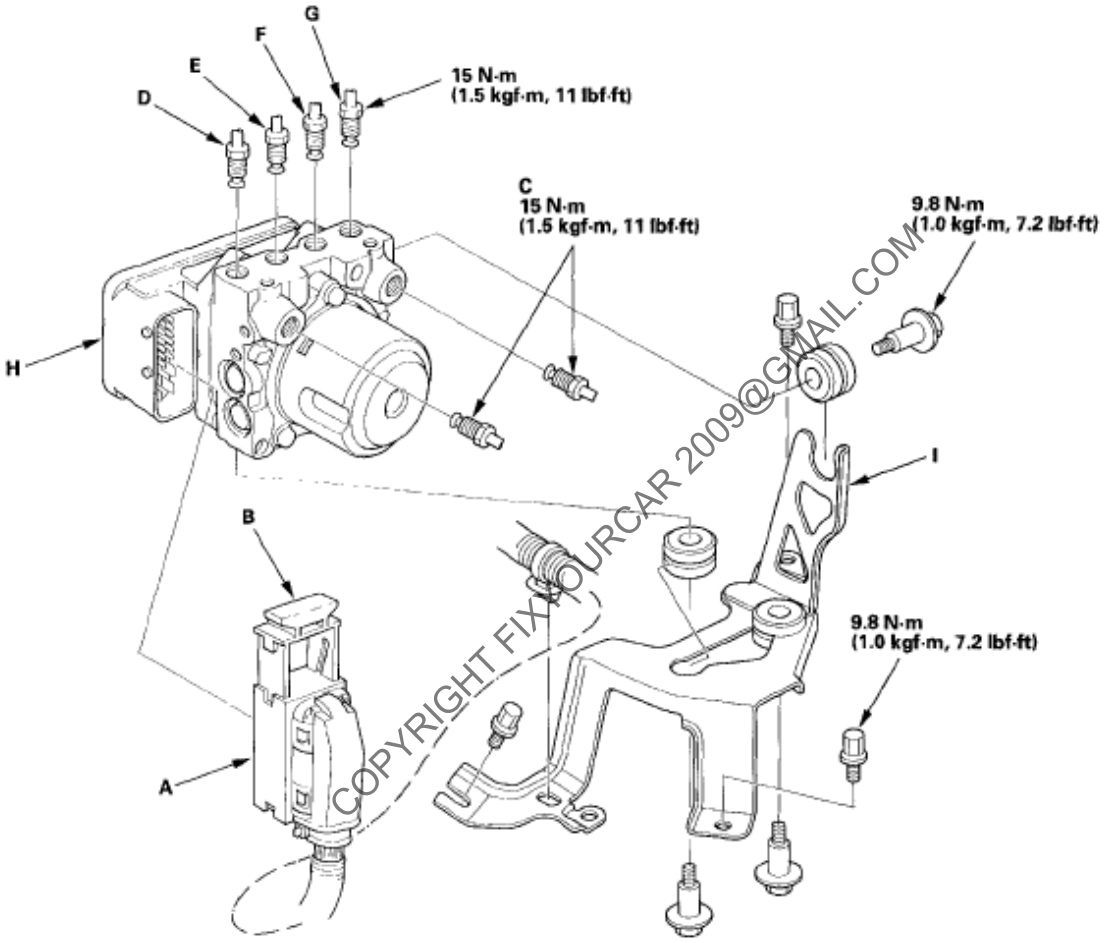

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Fig. 38: Removal And Installation Of ABS Modulator-Control Unit (With Specifications)

2. Disconnect the six brake lines from the ABS modulator-control unit.

NOTE: Brake lines are connected to the master cylinder (C) and to the right-front (D), the left-rear (E), the right-rear (F) and the left-front (G) brake system.

3. Remove the ABS modulator-control unit (H) with the bracket (I) from the body.

4. Remove the ABS modulator-control unit from the bracket.

INSTALLATION - EXCEPT SI MODEL

1. Install the ABS modulator-control unit on the bracket.
2. Install the bracket with the ABS modulator-control unit to the body.
3. Reconnect the six brake lines, then tighten the flare nuts to the specified torque.
4. Align the connecting surface of the ABS modulator-control unit 25P connector to the ABS modulator-control unit.
5. Lower the lock of the ABS modulator-control unit 25P connector, then confirm the connector is fully seated.
6. Bleed the brake system (see **BRAKE SYSTEM BLEEDING**).
7. Start the engine, and check that the ABS indicator goes off.
8. Test-drive the vehicle, and check that the ABS indicator does not come on.

NOTE: If the brake pedal is spongy, there may be air trapped in the modulator and then induced into the normal brake system during modulation. Bleed the brake system again (see BRAKE SYSTEM BLEEDING).

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REMOVAL - SI MODEL

1. Disconnect the ABS modulator-control unit 25P connector (A) by pulling up the lock (B); the connector disconnects itself.

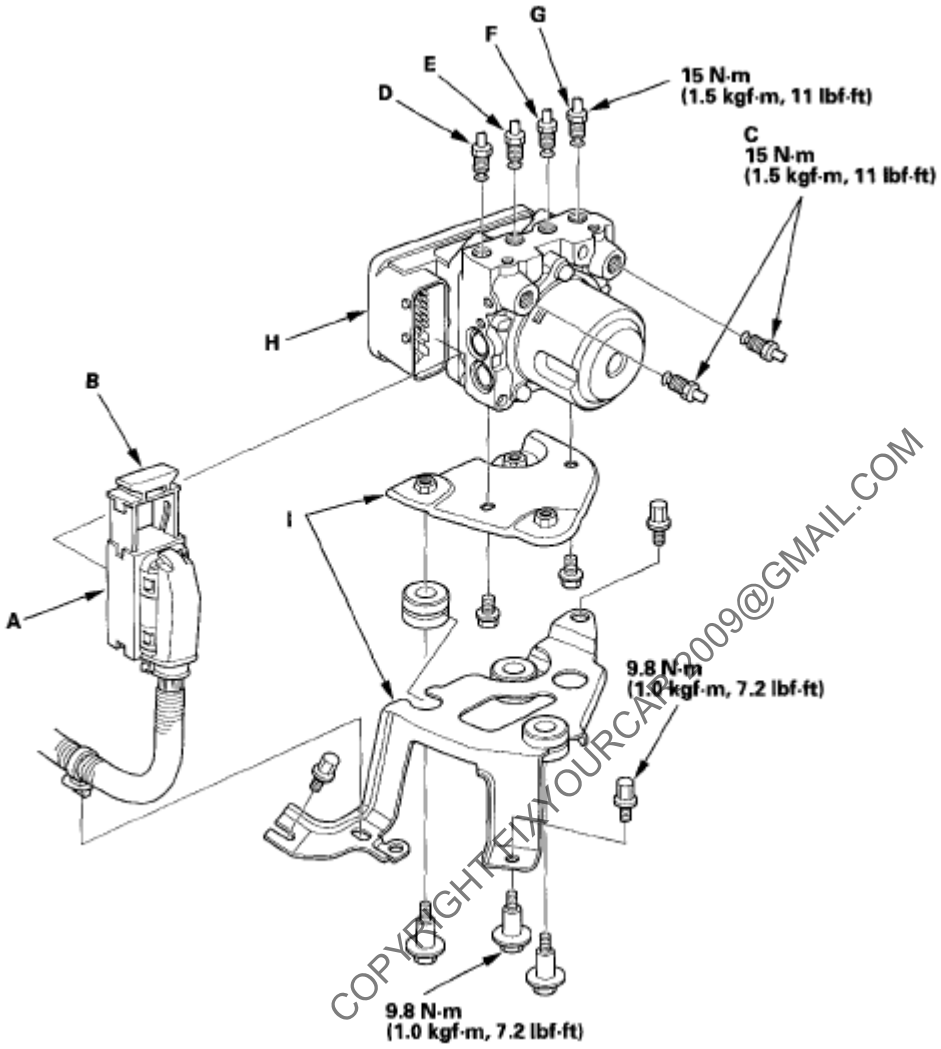

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Fig. 39: Disconnecting ABS Modulator-Control Unit 25P Connector (With Specifications)

2. Disconnect the six brake lines from the ABS modulator-control unit.

NOTE: Brake lines are connected to the master cylinder (C) and to the right-front (D), the left-rear (E), the right-rear (F) and the left-front (G) brake system.

3. Remove the ABS modulator-control unit (H) with the brackets (I) from the body.
4. Remove the ABS modulator-control unit from the brackets.
5. Separate the bracket if necessary.

INSTALLATION - SI MODEL

1. Install the ABS modulator-control unit on the brackets.
2. Install the bracket with the ABS modulator-control unit to the body.
3. Reconnect the six brake lines, then tighten the flare nuts to the specified torque.
4. Align the connecting surface of the ABS modulator-control unit 25P connector to the ABS modulator-control unit.
5. Lower the lock of the ABS modulator-control unit 25P connector, then confirm the connector is fully seated.
6. Bleed the brake system (see **BRAKE SYSTEM BLEEDING**).
7. Start the engine, and check that the ABS indicator goes off.
8. Test-drive the vehicle, and check that the ABS indicator does not come on.

NOTE: If the brake pedal is spongy, there may be air trapped in the modulator and then induced into the normal brake system during modulation. Bleed the brake system again (see BRAKE SYSTEM BLEEDING).

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WHEEL SENSOR REPLACEMENT

FRONT

1. Release the clamp (A), then disconnect the wheel sensor connector (B).

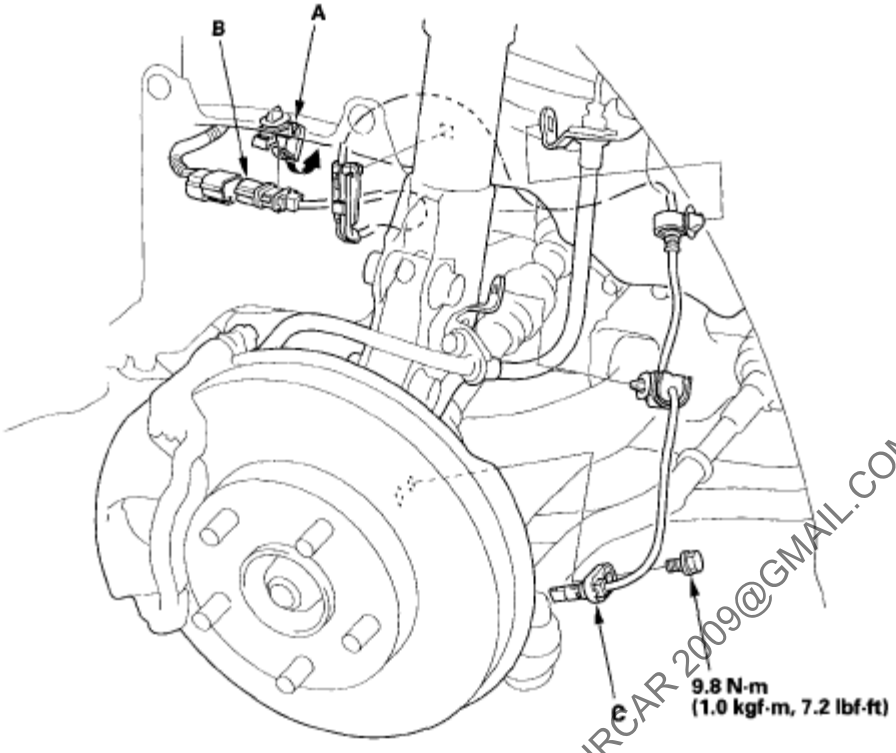

Fig. 40: Disconnecting Wheel Sensor Connector (With Specifications)

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2. Remove the clips, the bolt, and the wheel sensor (C).
3. Install the wheel sensor in the reverse order of removal, and note these items:
   - Install the sensor carefully to avoid twisting the wires.
   - If the wheel sensor comes in contact with the wheel bearing, it is faulty.
4. Start the engine, and check that the ABS indicator goes off.
5. Test-drive the vehicle, and check that the ABS indicator does not come on.

REAR

1. Release the clamp (A), then disconnect the wheel sensor connector (B).

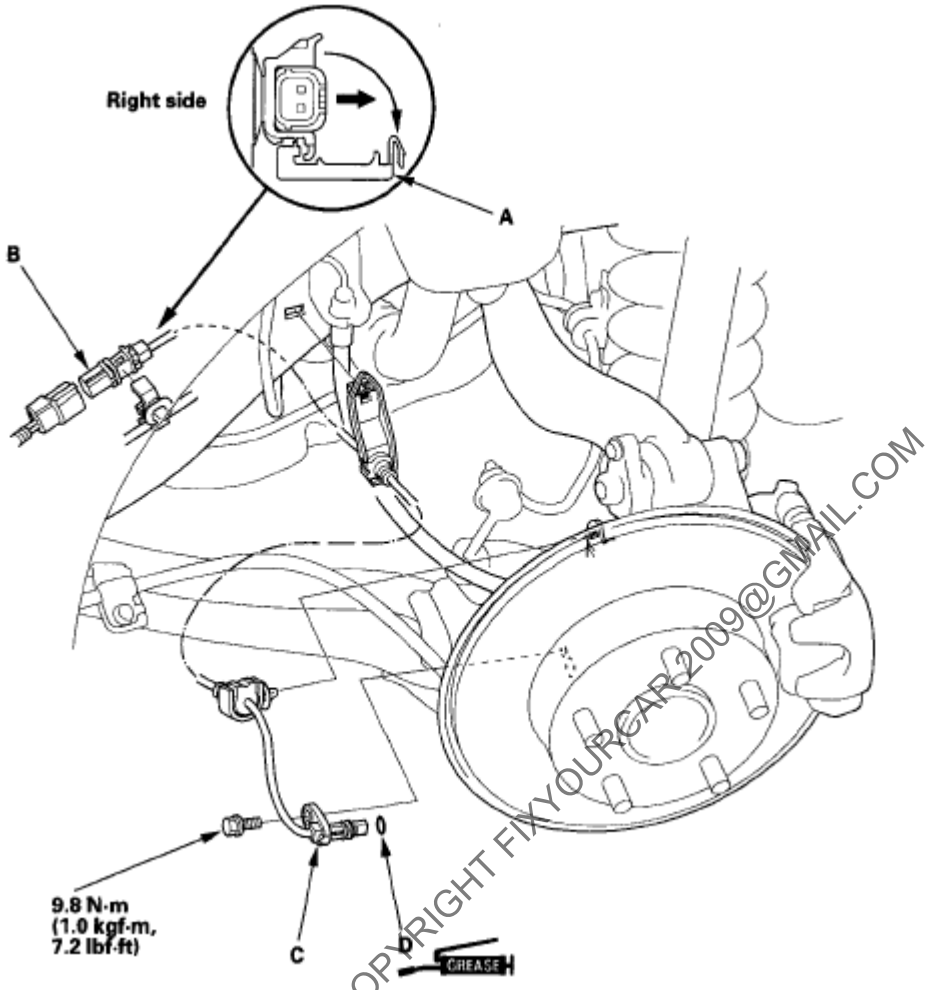

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Fig. 41: Disconnecting Wheel Sensor Connector (With Specifications)

2. Remove the clips, the bolt, and the wheel sensor (C).
3. Install the wheel sensor in the reverse order of removal, and note these items:
   - Apply multipurpose grease to the O-ring (D).
   - Install the sensor carefully to avoid twisting the wires.
   - If the wheel sensor comes in contact with the hub bearing unit, it is faulty.
4. Start the engine, and check that the ABS indicator goes off.
5. Test-drive the vehicle, and check that the ABS indicator does not come on.